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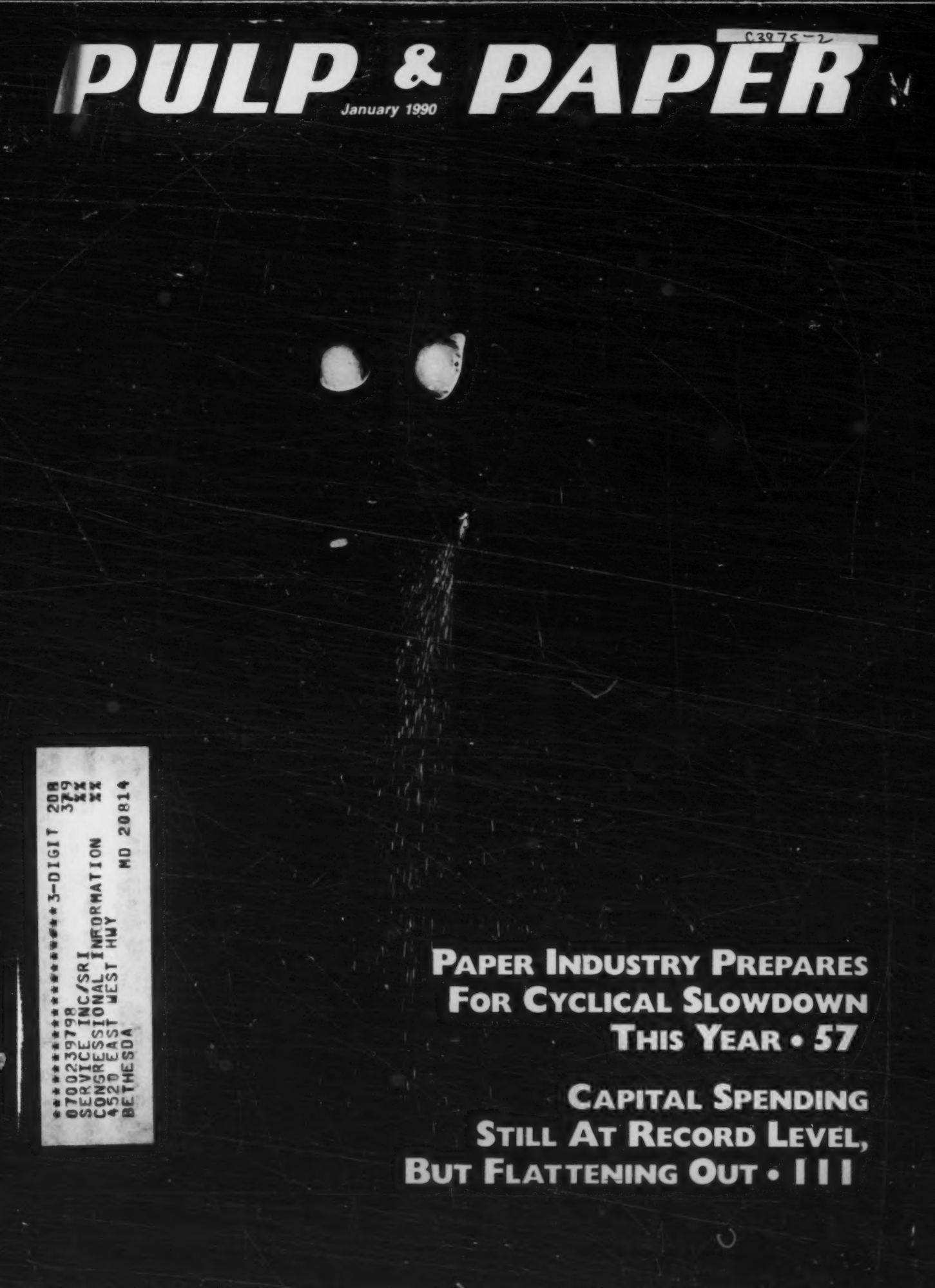
PULP & PAPER

January 1990



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Pulp & Paper's *Outlook '90 report (p. 57) indicates a gradual slowdown in operating rates, demand, and paper company profits beginning this year. However, expansion/modernization outlays are expected to stay at record levels, according to the special Capital Spending report beginning on p. 111.* (Photo of chemical pulp expansion at Consolidated Paper's Kraft Div. by Dick Durrance courtesy of Consolidated Papers Inc.)

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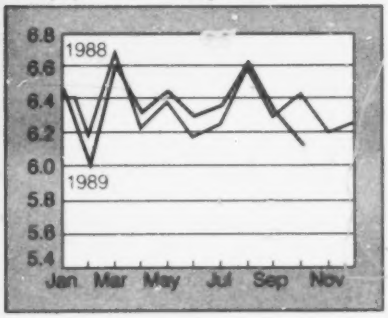
ABP

U.S. paper and board production



U.S. production of paper and paperboard totaled 6.6 million tons in October 1989, an increase of 2.1% over the previous year, according to American Paper Institute data. After seasonal adjustments, the rate of production through the first ten months of the year stood at 76.5 million tpy, up 0.1% from 1988. Strength was concentrated in the paper sector, API reported, as white paper shipments continued to rebound from a period of consumer inventory reductions. Paperboard production has weakened, however, after a strong showing through the first eight months.

Among major grades, October shipments of printing and writing paper were the highest for any month since March 1988. Coated paper shipments jumped 10% after July to a record monthly average of 581,000 tons for August to October. Kraft paperboard production peaked in August at 1.70 million tons and then declined to 1.62 million tons in October.

Canadian newsprint shipments totaled 852,000 metric tons in October, up 6.1% from October 1988. Woodpulp shipments dipped 7.2% for the month to 610,000 tons. Operating rates at Canadian mills declined to 96% for newsprint and 90% for woodpulp during October. ■

	Latest month (000 short tons)		% change from year ago	Annualized year-to-date (000 short tons)	% change from year ago
PAPER & PAPERBOARD PRODUCTION[1]					
Newsprint	Oct.	526	3.5	6,048	1.3
Uncoated groundwood (s)	Oct.	167	13.6	1,774	8.2
Coated paper (s)	Oct.	653	4.5	7,181	-3.2
Uncoated free-sheet (s)	Oct.	968	2.5	11,100	-1.9
Other printing/writing	Oct.	129	-0.8	1,526	0.9
Total packaging and other paper (s)	Oct.	438	0.9	4,915	-2.6
Tissue	Oct.	489	2.7	5,643	2.7
Total paper	**Oct.**	**3,369**	**3.2**	**38,186**	**-0.6**
Unbleached kraft paperboard	Oct.	1,624	3.0	19,622	1.4
Semichemical medium	Oct.	475	0.6	5,700	1.1
Bleached paperboard	Oct.	378	-0.5	4,543	0.6
Recycled paperboard	Oct.	759	-2.1	8,681	-2.2
Total paperboard	**Oct.**	**3,236**	**1.0**	**38,545**	**0.7**
Total U.S. paper and paperboard output	**Oct.**	**6,605**	**2.1**	**76,732**	**0.1**
PULP, WASTEPAPER & FIBER[2]					
Total U.S. woodpulp production	Sept.	5,070	1.3	62,328	2.0
Market pulp production	Sept.	719	-1.1	8,867	3.2
Wastepaper consumption at paper/board mills	Sept.	1,590	2.4	19,043	0.9
Pulpwood consumption (cords)	Sept.	8,167	2.7	98,769	3.6
CONVERTED PRODUCTS STATISTICS[3]					
Corrugated box shipments (billion ft²)	Oct.	28.961	3.8	263.864[6]	1.5
Containerboard inventories at U.S. box plants and mills	Oct. 1	2,642	-1.2		
INTERNATIONAL TRADE[2]					
U.S. paper imports (including products)	Sept.	1,061	-4.2	12,849	-0.3
Imports of Canadian newsprint	Sept.	652	-7.0	7,998[6]	-6.3
U.S. paper exports (including products)	Sept.	525	3.1	6,297	12.3
Exports of unbleached kraft linerboard	Sept.	167	-21.6	2,218	1.2
Exports of woodpulp	Sept.	548	5.8	6,398	16.6
Norscan pulp inventories[4]	Oct. 31	1,059	32.0		
Norscan pulp operating rates[4]	Oct.	92%	93%	101%	97%
CANADIAN STATISTICS[5] (reported in metric tons)					
Total newsprint shipments	Oct.	852	6.1	8,032[6]	-1.4
Operating rates	Oct.	96%	100%	95%	99%
Inventories held by U.S. consumers	Oct. 31	1,267	-16.5		
Other paper/board shipments	Oct.	607	8.0	5,638	1.2
Woodpulp shipments (export only)	Oct.	610	-7.2	6,473	-3.8
Operating rates	Oct.	90%	97%	96%	98%

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn., Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = Shipments.

Kraft linerboard: Mild downturn expected due to slower box cutup, new capacity additions

Unbleached kraft linerboard is made in a wide range of basis weights. Standard weight in the U.S. is 42 lb/1,000 ft² but other important weights are 26 lb, 33 lb, 69 lb, and 90 lb/1,000 ft². Major end use is in domestic corrugated container production, although about 13% of output is exported. Specialty grades include mottled white, solid white, and wet strength-treated board. Recycled linerboard production has grown close to 500,000 tpy but is not included.

Production: The U.S. linerboard market began to soften gradually in second-half 1989 after producers were unable to push through a price increase last spring. The main reasons for the easing in the market were slower growth in corrugated box shipments, restrained export demand, and increased industry capacity.

Box shipments were expected to be up about 1.9% in 1989, after growing at a 4.9% average annual rate over the 1986-88 period. Linerboard production for 1989 was expected to be up about 1.5% to 18.2 million tons. This would result in an operating rate of about 94.6%, down from 95.7% in 1988.

U.S. linerboard export shipments showed only modest growth in 1989 due to a strengthening in the dollar in the first half of the year, increased linerboard capacity overseas, and reduced demand from People's Rep. of China. U.S. linerboard production for export in 1989 was expected to be up about 1.5% to 2.33 million tons from the previous year, American Paper Institute statistics indicate.

Inventories of containerboard at box plants and mills dropped last fall and in October reached 2.45 million tons (4.9 weeks of supply)—a level slightly below the previous year.

Future outlook: Linerboard producers are expected to have a more difficult year in 1990. However, the downturn in the market is expected to be less severe than in 1982, when the U.S. experienced a major recession or in 1985 when the dollar was much stronger.

U.S. corrugated box shipments are projected to increase about 1.5% this year (assuming slower 1.7% growth in real GNP but no recession). Linerboard production is expected to be up 2.3% to 18.6 million tons, helped by an estimated 100,000 tons of inventory building at box plants. Operating rates for kraft linerboard mills are expected to decline from about 95% in 1989 to just below 94% in 1990—still a relatively high level.

U.S. linerboard exports are expected to increase by at least 5% in 1989 due to the weakness in the dollar, which has improved the competitive position of U.S. producers in world markets.

Capacity growth for kraft linerboard is expected to accelerate from 2.6% in 1989 to 3.1% this year and 3.9% in 1991. Gaylord Container Corp. will be bringing in a new 350,000-tpy machine at its Bogalusa, La., mill in the third quarter. Mead Corp. is also expected to start up its 375,000-tpy clay-coated kraft mill, which will initially produce some linerboard.

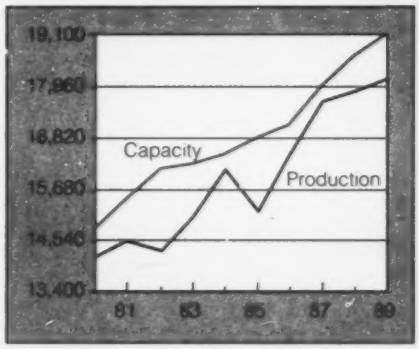
Prices: Since early 1986, linerboard producers have pushed through five $30/ton price increases, which took the price of 42-lb linerboard from $360 to $410/ton by spring 1988. Another attempt to raise prices by $30/ton to $440 in spring 1989 was unsuccessful due to strong resistance from independent converters.

The $410 U.S. list price on linerboard held through the end of 1989 although there were increasing reports of $10 and $20 spot discounts in the fall.

Stone Container Corp., the largest U.S. linerboard producer, has indicated plans for a possible $30/ton price increase on linerboard for Mar. 1, 1989. Nevertheless, there is skepticism regarding the success of the increase despite relatively high industry operating rates. Most analysts expect some erosion in price levels this year but not a collapse like the industry experienced in the first half of the 1980s.

Historical year-end prices for 42-lb linerboard delivered in the eastern U.S. open market (before zoned rebates): 1989, $410; 1988, $410, 1987, $380; 1986, $320; 1985, $260. (For more detailed statistical information, see *Pulp & Paper 1989 FactBook*).

SUPPLY/DEMAND (000 tons)



FORECAST (000 tons)

U.S.	1988	1989e	1990e
Production[1]	17,897	18,160	18,570
Capacity[1]	18,705	19,195	19,781
Utilization rate	95.7	94.6	93.9
Imports[2]	86	87	80
Exports[3]	2,296	2,330	2,445
Apparent U.S. consumption	15,687	15,922	16,210
lb/capita	127.4	127.9	129.1
GNP ratio[4]	3.99	3.83	3.83

e = Estimate.
1. Based on 1989 API capacity survey.
2. Dept. of Commerce.
3. API (includes some coated box board and specialty grades).
4. 1,000 tons/billion dollars real GNP.

TOP U.S. PRODUCERS (000 tpy)

	Annual capacity	Market share (%)
1. Stone Container	2,750	14.3%
2. International Paper	1,850	9.6
3. Weyerhaeuser	1,530	7.9
4. Jefferson Smurfit/CCA	1,450	7.5
5. Georgia-Pacific	1,375	7.1
6. Union Camp	1,350	7.0
7. GN Nekoosa	1,250	6.4
8. Temple-Inland	1,235	6.4
9. Packaging Corp.	800	4.2
10. Willamette	800	4.2

Market share of top five companies:
46.6%

Market share of top ten companies:
74.9%

Total U.S. capacity (1989):
19,195 million short tons

1. Includes all of Stone Container's 49% owned Seminole kraft mill in Jacksonville, Fla., Canadian capacity.
2. Excludes Inland's 205,000-tpy recycled liner mill in Ontario, Calif.

U.S. PAPER INDUSTRY IS PREPARED FOR CYCLICAL SLOWDOWN THIS YEAR

Operating rates will drop as capacity surges and demand weakens—leading to lower prices and profits

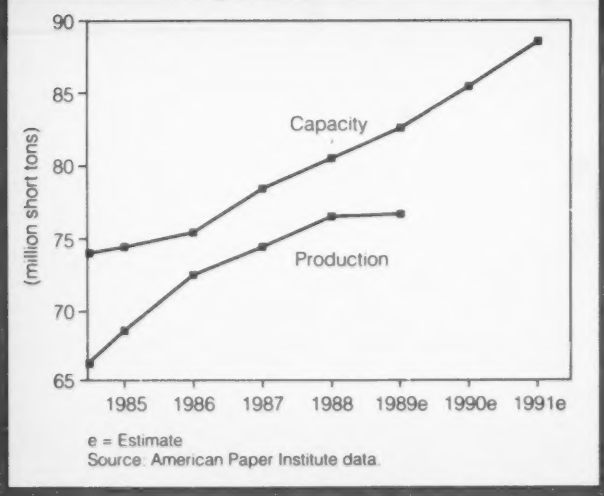
The U.S. paper industry's three-year period of soaring prices and profits reached a peak in third-quarter 1989. By the end of the year, weaker demand for the industry's products and shrinking backlogs of unfilled orders signaled a slowdown in the general economy and a reversal of the industry's boom cycle, which saw most grades of paper and paperboard in short supply. Instead of signaling a headlong plunge into an economic recession, however, the paper industry trend portends a gradual shift from an inflationary market to a slow deflation.

With the decline in inflation to below 5%, the Federal Reserve Board has allowed interest rates to decline, slowly at first but more rapidly since last October, to avoid a recession. Now that interest rates have declined to approximately 8.5%, and are projected to decline further, many paper industry executives hope consumers and businesses will resume spending and in so doing create an economic revival. "Rare is the economy that declines in an environment of falling interest rates," said Stephen Roach, senior economist at Morgan Stanley.

Paper company executives and financial analysts surveyed by *Pulp & Paper* openly acknowledged concerns about the industry's changing fortunes. However, none believe the paper industry is headed for a prolonged slump similar to the early 1980s, when a deep recession coincided with tough foreign competition and a strong dollar. U.S. paper companies have slashed costs dramatically in recent years and now are among the most effi-

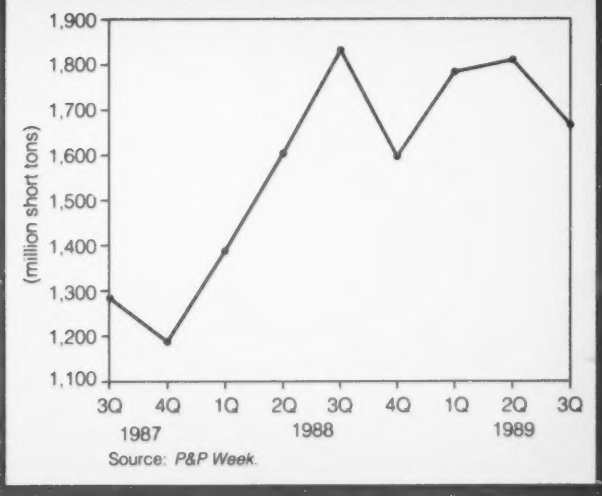
Outlook '90 was prepared by Pulp & Paper *news staffers Noel DeKing in New York and Regina McGrath, Debra Garcia, Rob Galin, and Will Mies in San Francisco.*

U.S. paper and board production is falling further behind capacity additions . . .



e = Estimate
Source: American Paper Institute data.

. . . and profits are suffering



Source: *P&P Week.*

cient and lowest-cost producers in the world. A spokesman for Champion International said, "We've gotten our costs down and we're better positioned for any cyclical downturn than we've ever been."

For 1990 and 1991, the principal concern is that demand growth will lag new supply, leading to lower operating rates and falling prices. After six years of strong GNP growth, averaging 4.1% annually, the U.S. economy has slipped into a period of slower growth, which is bad news for the paper industry, whose fortunes rise and fall with the economy. Merrill Lynch Economics forecasts real GNP growth to range between 1.5% and 2.5% during the next 18 months. The impact of this downward growth trend is not likely to be as severe on the paper industry as previous periods of real economic recession, when growth rates were negative. The consensus forecast of analysts surveyed by *Pulp & Paper* calls for a 1.9% gain in paper and paperboard production this year to about 77.8 million tons.

CAPACITY SURGE. Unfortunately, a 1.9% growth rate is not enough to keep U.S. paper mills running at full capacity while new capacity is being added. Paper companies spent a record $15.2 billion last year on new paper machines and related process equipment. The paper industry led all other U.S. manufacturing industries in the percentage increase of capital spending last year, a remarkable 35% increase over 1988. This heavy spending raised capacity an estimated 4.0% to 82.5 million tons, although output increased less than 1%. Thomas Clephane, an analyst at Morgan Stanley, expects capital spending to remain at about the same level in 1990, with the bulk of investment going into new incremental capacity expansions and modernization projects, rather than new greenfield mills or even new paper machines.

Paper companies are forecast to increase capacity by another 3.5% this year, raising total paper and paperboard production to over 85 million tons. Industry operating rates, the key barometer of the industry's health, are projected by some analysts to drop below 92% because of the surge of new capacity coming onstream this year. "We look for operating rates to decline because the industry is adding capacity faster than likely demand growth," said Sherman Chao, an analyst with Salomon Brothers. "This means that prices will drop, and the seller's market we've seen over the last few years will come to an end."

TABLE 1: **Analysts' projections for 1990.**

	Percentage change from 1989 levels (Unless otherwise indicated)								
	Growth in real GNP	Paper and board production	Operating rates[1] Paper	Paperboard	Prices	Costs[2]	Earnings Paper	Forest	Housing starts[3]
Thomas Clephane Jeanne Carroll Morgan Stanley	2.0	1.5	91.8	93.0	(1.0)	4.5	(20)	(15)	1.40
Sydna Lyss Merrill Lynch	2.0	3.4	94.1	92.7	(5.3)	3.0	(7.7)	10	1.43
Mark Kurland Mabon Nugent	1.5	1.5	93.6	93.1	(5.0)	3.0	(15)	(20)	1.40
Lawrence Rose Paine Webber	1.5	2.0	91.0	92.0	(2.0)	4.5	(8)	(8)	1.50
Theresa Farrell Deutsche Bank	1.0	0.0	93.0	92.0	2.0	2.0	(10)	15	1.60
William Wigder First Boston	2.0	2.0	90.0	91.5	(6.0)	4.0	(25)	5	1.44
Kathryn McAuley First Manhattan	2.2	1.0	92.0	94.0	(6.5)	3.0	(12)	(5)	1.50
Sherman Chao Salomon Brothers	1.9	2.0	91.9	92.8	(7.5)	3.0	(22)	15	1.48
Gary Palusso Oppenheimer & Co.	2.0	1.6	91.5	92.2	(7.6)	4.0	(10)	(25)	1.37
Mark Rogers Prudential Bache	3.0	3.3	92.4	92.1	(3.1)	2.0	(10)	(15)	1.45
Chad Brown Drexel Burnham Lambert	1.1	2.0	91.5	91.2	(2.7)	4.0	(21)	(15)	1.50
Mark Diverio Shearson Lehman Hutton	1.9	2.3	92.0	93.0	(5.0)	3.0	(5)	—	1.39
Average	1.9	1.9	92.1	92.2	(4.1)	3.5	(15.3)	(9.8)	1.44

( ) represents a negative figure.
1. Production as percent of capacity. 2. Costs per unit output. 3. Millions of units.

PRICE TRENDS. The signs of weakness in some paper grades are already evident as a result of supply/demand imbalances. Newsprint prices have fallen sharply, to about $540/metric ton, down 15% from a year ago. A projected addition of 2 million tons of North American capacity scheduled for 1989-90 will further erode prices and lead to permanent closures of older, inefficient newsprint mills, analysts say. "While this sector has already experienced a sharp deterioration of business, things could get worse before they get better," said Thomas Farrell, an analyst with Deutsche Bank Group.

Price discounting has also been widely reported in linerboard, certain grades of coated and uncoated paper, and hardwood and softwood bleached kraft pulps. "Many companies will have to be concerned about new and vigorous competition in market pulp, linerboard, and uncoated paper," said Gary Palmero, an industry analyst at Oppenheimer. "In downturns, that creates competitive price discounting pressure; it has existed before." Bleached paperboard prices are expected to remain firm, and possibly increase, because demand will outstrip available supply.

EARNINGS OUTLOOK. Most of the analysts surveyed agreed weaker demand and softer prices have dimmed earnings prospects for this year. Paper company earnings increased an estimated 5% last year to approximately $8.5 billion, after increasing 46% in 1988 and 43% in 1987. This year, some pessimistic analysts predict earnings will decline by as much as 25%, while more optimistic analysts predict a decline of 10% or less. Even a severe decrease, however, would not roll back profits to pre-1987 levels. Additionally, earnings estimates of most paper companies already reflect an expected profit slump, so the share price of these companies may fall only 5% to 10%, said Lawrence Ross of Paine Webber.

The largest earnings declines are projected for commodity-oriented paper companies that produce a majority of pulp, newsprint, and containerboard grades. Their prices are likely to be more volatile in the future. Chao believes even uncoated freesheet is increasingly becoming a commodity-like paper grade subject to wide price swings. Compared with commodity paper producers, analysts project better earnings for paper companies with strong consumer products businesses and wood products businesses because of strong prices for tissue products, woodchips, lumber, and plywood. Earnings of paper companies that are net purchasers of market pulp will also benefit from lower pulp prices.

WEAK DOLLAR. Evidence of a weakening U.S. economy has put downward pressure on the dollar, which is good news for U.S. exporters. The dollar rose 15% at midyear to its high of DM 2.03 and ¥ 149 on June 14, then dropped to DM 1.85 and ¥ 143 by last November. A further 10% decline is expected in 1990 as a result of rising interest rates in Fed. Rep. Germany and Japan, which should sustain the U.S. paper industry's high export volume. Merrill Lynch's Evadna Lynn expects the dollar to stabilize within the recent range, compared with the steady weakening during 1985-88. This stabilization should cause price trends for export-influenced grades to be more influenced by the supply/demand balance than exchange rate trends.

In 1989, pulp exports jumped approximately 15%; paper grades, mostly newsprint, rose an astounding 43%; and paperboard grades, mostly linerboard, increased 10%. A sharp drop-off in orders from People's Rep. China hurt linerboard exports, but export growth in other Asian markets was strong. Exports of bleached paperboard, mostly milk carton stock, also showed good growth in Asian markets.

TABLE 2: **Industry operating rates.**

	Operating rates (%)				
Paper	1988	1989	1987	1986	1985
Newsprint	93.9%	97.0%	97.3%	97.6%	95.0%
Uncoated groundwood	89.0	91.4	90.5	95.7	94.2
Coated paper	88.2	92.9	93.1	94.0	88.6
Uncoated free-sheet	92.2	94.4	95.4	94.8	89.4
Bristols	87.8	98.6	93.0	98.2	96.2
Thin paper	80.4	79.2	82.6	79.3	75.1
Cotton paper	77.0	79.2	82.3	83.6	79.1
Packaging and industrial	87.0	88.9	90.2	93.8	90.2
Tissue	92.4	93.1	96.3	97.3	97.6
Total paper %	89.5%	93.2%	94.2%	95.9%	91.9%
Paperboard					
Kraft linerboard	90.7%	95.6%	98.5%	96.2%	94.6%
Other kraft	84.3	88.9	82.5	80.0	83.9
Total	89.5%	95.0%	91.1	89.7	87.5
Semichemical	94.0	96.7	97.4	97.7	95.2
Bleached board	90.3	93.3	94.2	95.7	96.0
Recycled	86.8	89.7	92.8	92.8	90.2
Total paperboard %	89.6%	93.6%	93.2%	95.3%	94.1%
Total paper and paperboard %	89.5%	93.5%	93.2%	95.3%	94.1%

Source: American Paper Institute and Pulp & Paper estimates

On the domestic side, imports of market pulp were down an estimated 1%, and newsprint was down 7%. Imports of uncoated groundwood paper and bleached printing bristols increased more than 10%. Most of these are from Canada, which accounts for 75% to 80% of foreign shipments to the U.S. The 1988 U.S./Canada Free Trade Agreement has given a tremendous stimulus to the Canadian paper industry. Tariffs on cross-border trade of all paper products will be completely removed by the end of 1992. The output from a number of new paper machines currently being installed in Canada is destined for the large U.S. market. At the same time, some large U.S. linerboard producers hope to gain additional business in Canada.

CONSOLIDATIONS. Stone Container Corp.'s $2.2-billion acquisition of the Canadian company Consolidated-Bathurst Inc. was the most significant consolidation in the paper industry last year. The merger with Canada's fifth-largest pulp and paper company boosted Stone Container to the second-largest pulp, paper, and paperboard producer in the world. The acquisition gave Stone a greater stake in market pulp and newsprint and a foothold in the European market. International Paper Co. and James River Corp. have also made strategic acquisitions in Europe to strengthen their role in the European single market that will emerge in 1992.

Last November, Georgia-Pacific Corp. announced a 3.18-million hostile takeover bid for Great Northern Nekoosa Corp. The potential merger would create the largest paper and forest products company in the U.S. and a major competitor on a global scale. The purchase of Great Northern would easily eclipse G-P's $545-million purchase of Brunswick Pulp & Paper Co. and the $220-million purchase of American Forest Products Co. L.P. in 1988. If it is successful, the merger would make G-P the leading U.S. producer of kraft linerboard, uncoated white business paper, and market pulp and a major supplier of corrugated containers.

TABLE 3: **Industry production.**

	Production (000 tons)				
Paper	1985	1986	1987	1988	1989e
Newsprint	5,428	5,630	5,482	5,982	6,019
Uncoated groundwood	1,521	1,540	1,498	1,624	1,761
Coated paper	5,875	6,263	6,860	7,359	7,109
Uncoated free-sheet	9,690	10,410	10,966	11,277	11,042
Bristols	930	990	1,052	1,150	1,173
Thin paper	262	247	240	217	196
Cotton paper	144	152	163	167	159
Packaging and industrial	5,204	5,117	4,955	5,047	4,882
Tissue	4,941	5,095	5,301	5,476	5,618
Total paper	33,995	35,444	35,679	36,399	37,959
% change	−1.3%	4.3%	4.0%	2.0%	−6.6%
Paperboard					
Kraft linerboard	15,183	16,402	17,683	17,897	18,301
Other kraft	1,185	1,267	1,215	1,244	1,335
Total	16,368	17,669	18,898	19,140	19,636
Semichemical	5,086	5,376	5,636	5,684	5,700
Bleached board	3,948	4,271	4,406	4,511	4,544
Recycled	7,630	8,083	8,601	8,789	8,639
Total paperboard	33,034	35,419	37,442	38,125	38,519
% change	−3.6%	7.3%	7.2%	1.8%	1.1%
Total paper and paperboard	67,029	70,863	74,318	76,469	76,477
% change	−2.1%	5.7%	4.9%	2.8%	0.0%

e—Estimates. Source: American Paper Institute.

UNCOATED FREE-SHEET

MARKETS LIKELY TO REMAIN COMPETITIVE

■ Markets for uncoated free-sheet paper turned very competitive in 1989, and observers both inside and outside the industry expect 1990 to continue that competitive trend. The problem is a combination of major expansions and inventory corrections resulting from panic orders during the continuous price increases of mid-1986 through early 1988.

But the market all but collapsed upon itself in 1989 and prices plunged downward, sometimes as much as $100 or more off list. Most industry sources expect (or hope) prices will stabilize and perhaps gain back some lost ground.

Operating rates may be in the low 90% range with demand growth at about 2.5% to 3% for the year, according to Dana G. Mead, executive vice president, International Paper Co. He does not foresee any end-use segments becoming particularly weak and, in fact, sees some strength in every grade.

Uncoated free-sheet has undergone a tremendous growth in capacity in recent years, including four new machines in Canada since 1987 and three in the U.S., plus incremental expansion. All told, capacity has in-

creased about 8%—almost 1 million tons—in three years. However, new capacity coming onstream in 1990 will be at the end of the year (Willamette Industries Inc., Bennettsville, S.C., and Boise Cascade Corp., International Falls, Minn.), so it will not be seriously felt in the marketplace until 1991.

Of equal importance, analysts project 1% to 2% growth in the gross national product (GNP), rather than a recession. A recession could have affected business paper use and advertising. John Maine, vice president printing and writing paper at Resource Information Systems, expects an economic slowdown with GNP growth at 1% to 1.5%, bringing industry profits lower in 1990 than they were in 1989.

Shipments of uncoated groundwood paper in North America will increase about 5.6% in 1990, compared with 5.7% for all printing and writing grades, according to Evadna Lynn, first vice president at Merrill Lynch Capital Markets.

SEGMENTS GROW LESS THAN 5%. Essentially all segments of the uncoated free-sheet sector are projected to post growth rates of less than 5% in 1990. The strongest area is bond and writing paper, which will grow about 4.1% based on continuing strong demand for cut-size copy paper (also used in computer page printers). Bond and writing is the largest end use, followed closely by offset, which is expected to advance only 2.9% in 1990. The third major group is forms bond, which is affected by growth in cut-size. Paper shipments for this end use will match the growth of offset.

Carbonless paper, a small but quickly growing use, is expected to calm down from its recent double-digit growth and settle at just 2.0% for 1990, though demand will pick up again as the economy turns around in the next few years.

Envelopes, both white wove and kraft combined, will gain slightly less than 3% in 1990, with white wove doing slightly better than kraft. Cover and text and tablets will do even better, with growth of 4.0% and 3.7%, respectively.

COATED PAPER

NEW CAPACITY OUTSTRIPS DEMAND

■ New capacity for coated paper, especially coated groundwood grades, is moving strongly ahead of demand, although demand may be two or three times as high as the rate of general economic growth. As a result, operating rates are likely to hover in the low 90% range and possibly even lower, some observers say.

Papermakers generally remain optimistic about coated markets, though both coated free-sheet and coated groundwood will be competitive from a pricing standpoint.

Dana G. Mead, executive vice president of International Paper Co., said a lot of coated free-sheet is coming onto the market, but demand is likely to be up at least 2.5% to 3% for the year, and probably higher. Thus, competitive pricing will be induced more by supply than demand, he said.

Another optimistic note is sounded by Patrick F. Brennan, president of Consolidated Papers Inc. He said customers, particularly publishers, have indicated they plan to take full contract tonnage in 1990. Coated free-sheet demand remains strong, and Consolidated still has its premium No. 1 Reflections grade on allocation. Brennan "is aware of additional capacity coming onstream."

Consumer spending is likely to rise in most areas where advertising is heavy, such as food and apparel, but perhaps not in automobiles, according to Norma Pace, president of Economic Consulting & Planning. Therefore, modest expansion will occur in grades of paper that serve these areas.

In the area of inserts/coupons, Pace sees a possible growth slowdown. "You can't help but sense we're coming up against a stalling market there, that people are not responding to coupons as they did before," she said. Inserts primarily use coated groundwood paper (about 783,000 tons in 1988) and newsprint (720,000 tons in 1988), according to Andover International Assn.

In end-use segments, magazines continue to do well, as will catalogs and commercial printing (direct mail, circulars, annual reports, etc.), said John Maine, vice president—printing and writing paper, Resource Information Systems.

Evadna Lynn, first vice president at Merrill Lynch Capital Markets, expects coated groundwood shipments to rise 8.3% in 1990 from last year and coated free-sheet to increase 8.5%.

Operating rates for counted groundwood will be about 90.3% in 1990, the same rate as in 1989, estimates Jeanne K. Carroll, analyst at Morgan Stanley.

NEW CAPACITY CREATES PROBLEMS. A number of new machines will affect the market in 1990. Blandin Paper Co. started up its 254,000-tpy coated groundwood machine late in third-quarter 1989, and effects of that tonnage will be felt this year. (Blandin postponed addition of a second lightweight coated [LWC] machine at Grand Rapids, Minn., because of current market conditions.) Also starting up in late 1989 was Repap Enterprises Inc.'s 200,000- to 250,000-short-tpy machine at Newcastle, N.B., which will swing between coated groundwood and coated free-sheet. These machines will add to the competitiveness of the coated groundwood market in 1990, according to Maine.

Westvaco Corp. plans to start up its new 100,000-tpy coated free-sheet machine at Wickliffe, Ky., sometime in first-quarter 1990. In addition, Scott Paper Co. will start

up a 215,000-tpy lightweight coated free-sheet machine at Skowhegan, Maine.

The European market, where publication grade paper will be in abundant supply, will also provide pressure, according to the European Paper Institute (EPI). EPI's *Paper Capacity Report for Woodcontaining Publication Papers in Reels* says the coated mechanical side is likely to be hit hardest, with operating rates dipping to 84.1% in 1990 and 81.2% in 1991, compared with an estimated 96.3% utilization rate in 1988 and 91.4% in 1989.

EPI estimates coated mechanical capacity will rise from 4.044 million metric tpy in 1988 to 6.178 million tons in 1993, not including planned projects, which have not received final approval. These projects could add more than 400,000 tons to the total.

TISSUE

MORE CAPACITY, STABLE DEMAND

TABLE 4: **North American tissue expansions.**

Startup date announced	Company	Mill	Annual capacity (short tpy)
Apr. 1987	Fort Howard Corp.	Rincon, Ga.	86,250
Feb. 1988	Georgia-Pacific Corp.	Palatka, Fla.	35,000
Apr. 1988	Fort Howard Corp.	Rincon, Ga.	86,250
Oct. 1988	James River Corp.	Clatskanie, Ore.	70,000
Late 1988	Tagsons Papers Inc.	Mechanicville, N.Y.	n.a.
Apr. 1989	Fort Howard Corp.	Green Bay, Wis.	n.a.
Aug. 1989	Fort Howard Corp.	Rincon, Ga.	86,000
Sept. 1989	Vicell Canada Tissue Ltd.	Delta, B.C.	9,000
Nov. 1989	Irving Tissue Co.	St. John, N.B.	75,000
Dec. 1989	Atlas Paper Mills	Hialeah, Fla.	14,000
Dec. 1989	FSC Paper Co.	Alsip, Ill.	70,000
Jan. 1990	Atlantic Packaging Corp.	Whitby, Ont.	43,000
Feb. 1990	Cascades Inc.	Kingsey Falls, Que.	31,300
Mid- 1990	Wisconsin Tissue Mills	Menasha, Wis.	80,000
Late 1990	Kimberly-Clark Corp.	Loudon, Tenn.	34,000
1990	Kimberly-Clark Corp.	Janks, Okla.	68,000
Mid- 1991	Fort Howard Corp.	Rincon, Ga.	86,000
1991	Perkins Papers Ltd.	Candiac, Que.	28,000
Proposed			
n.a.	American Tissue Corp.	Natchez, Miss.	n.a.[2]
n.a.	James River Corp.	n.a.	n.a.[3]
n.a.	Potlatch Corp.	Lewiston, Idaho	n.a.[4]
n.a.	Fort Howard Corp.	n.a.	n.a.[5]
n.a.	Scott Paper	n.a.	n.a.[6]

n.a.—Not available.
1. Incremental capacity expansion from rebuild.
2. Conversion of Diamond International Corp.'s idle molded pulp mill.
3. Will start up two tissue machines between 1989 and 1994.
4. Studying rebuild of machine.
5. Seeking permits to expand its mills in Green Bay, Wis., and Muskogee, Okla.
6. Planning greenfield tissue mill in U.S., will add rebuilt machine at Chester, Pa.

■ In January 1989, Procter & Gamble Co., the market leader in consumer bathroom tissue, led a 9.8% price hike on consumer bathroom tissue sold east of the Rocky Mountains and an 8.0% increase in markets west of the Rockies. An increase of such size is unlikely to occur early this year because the economy is slowing down. Also, tissue mills no longer can cite rising pulp prices as an excuse for raising prices.

One has to take announcements of price increases in the consumer tissue market with a large grain of salt. Discounting to maintain market share often erodes price increases, and hikes are often postponed for as much as six months after an announcement. For example, last July, Scott Paper Co. said it lost some market share in the premium branded market because competitors lagged in implementing the hike announced in January. Producers can also manipulate sheet counts to give themselves de facto price increases. Generally, producers are lucky if they can implement half the amount of the announced increase in such a competitive market.

In a slower economy, consumers are likely to trade down to lower-priced tissue, which will hurt the large consumer tissue producers—P&G, Scott, and James River Corp. They will also be more inclined to buy private-label tissue products. Private-label napkins currently outsell all the national brands. People are likely to eat out less often, which will curtail demand for commercial and industrial (C&I) tissue.

In October 1989, Fort Howard Corp. announced it was increasing the price of its towels, toilet paper, napkins, and facial tissue sold on the C&I market by 5% to 7%. Fort Howard is the market leader in the C&I sector, with about a 31% market share. The company is said to be running its mills at capacity, and to avoid long lead times on orders, it decided to raise prices. Fort Howard could also use the money from the price hike to help fund its plans to add three new tissue machines over the next five years and pay down some of the debt incurred during its leveraged buyout. Competitors, like Scott, James River, Georgia-Pacific Corp., and Marcal Paper Mills Inc., supported the increase. Industrial paper merchants were surprised by the increase, which came at a time of weakening demand, and few felt it would stick.

Traditionally, C&I producers have slated two price increases a year, one in the spring and one in the fall. Given the weakening market, however, a price hike this spring is doubtful unless the increase announced last fall fails completely.

NEW CAPACITY COMES ON. Several new tissue machines started up late last year, which should ease the tight supply situation some producers have been complaining about but will also make it harder to keep prices up. In addition to Fort Howard, Scott has announced it will add capacity in North America and is evaluating various mill sites. It reportedly is planning to build a very large recycled tissue machine. Last fall,

Scott Paper Ltd. said it would build a 300-air-dry-metric-tpd bleached chemi-thermomechanical pulp (BCTMP) mill at its 170-metric-tpd tissue mill in Crabtree, Que., at a cost of C$110 million. The mill will supply the Crabtree mill as well as Scott's tissue mills in the U.S.

Two recycled tissue machines started up in second-half 1989. The third machine at Fort Howard's Savannah River mill in Rincon, Ga., started up in August. And FSC Paper Co.'s 70,000-tpy machine in Alsip, Ill., was expected to come online in late November or December. Irving Paper Co. started up a 75,000-tpy tissue machine based on virgin kraft pulp last November. Atlantic Packaging Corp.'s 43,000-short-tpy machine in Whitby, Ont., is slated to start up in January. Three more machines are slated to start up this year (Table 1).

Perhaps one of the more interesting developments is Cascades Inc.'s announcement that it is making "environmentally friendly" toilet tissue, adult diapers, and sanitary napkins at its mill in Kingsey Falls, Que., using 100% BCTMP from its Port Cartier, Que., mill. Cascades is the first established North American paper company to position its products this way, following the lead of the Scandinavians.

CONTAINERBOARD

MORE DIFFICULT TIMES AHEAD

■ Signs of softness began to appear in the U.S. linerboard market in second-half 1989. The first indication the market might be turning came last spring when producers were unable to push through a $30/ton price increase from the current $410 list level. By fall, reports of $10 to $20/ton spot discounts off the list price were made in the Northeast and some other sections of the country.

Some of the pressure on prices was probably coming from independent converters whose margins were squeezed by the sharp run-up in roll-stock prices over the 1986-88 period. Partly due to the need of such customers to get cost relief, corrugating medium prices began to erode during the summer months and dropped by $30 to $40/ton in some regions.

Pressure may also have come from linerboard price erosion in offshore markets, which made exporting less attractive to U.S. producers and may have contributed to a buildup in mill inventories. U.S. linerboard production for export through the first nine months of 1989 was up only about 1%, according to American Paper Institute (API) statistics. Nevertheless, inventory levels at both the converting and mill levels remained relatively low through September and were 2.5% below a year ago when the market was considered to be tight.

INCREMENTAL PROJECTS ADD UP. Some observers worried because the softness occurred even though U.S. corrugated box shipments were still fairly healthy. Box shipments in third-quarter 1989 were up 3.0% from a year ago, bringing the year-to-date increase to 2.3%. "If mills are being this competitive now, think what it will be like if we have a recession," one agent remarked.

Another factor blamed for the surplus linerboard tonnage sloshing around the market last fall was the large number of incremental expansion projects under way in the industry. Nevertheless, the last API survey (1988) showed capacity was supposed to have increased only 2.5% last year. That rate will accelerate to 3.7% in 1990 and increase further to 4.9% in 1991.

Gaylord Container Corp. will bring on a 350,000-tpy machine at its Bogalusa, La., mill in second-half 1990, following the rebuild of the large machine at its Antioch, Calif., mill, which will add about 140,000 tpy. Some industry executives are worried about how well all of this new tonnage will be marketed by the new and financially leveraged company—although it will take at least several months for the machines to reach design capacity, the company recently noted. In addition, Mead Corp. will probably begin producing linerboard on its new 420,000-tpy clay-coated kraft board machine later this year.

DIFFICULT YEAR—BUT NO REPEAT OF 1985. As a result, many analysts expect the industry to have a fairly difficult year in 1990—although most don't expect a price collapse like the industry experienced in the 1982 or 1985 market downturns.

For example, Thomas P. Clephane of Morgan Stanley expects the industry to operate at 95%, which "is much higher than the 84% in 1982 and 91% in 1985. There was also a 10% capacity increase in 1981-82 coupled with a severe recession. The U.S. dollar valuation and export demand are totally different from those of 1985, when there was a 20% decline in linerboard exports from the 1983 level." He projects linerboard prices will erode only slightly later this year and bottom at $390 in first-half 1991.

More pessimistic is Evadna Lynn of Merrill Lynch, who sees linerboard operating rates declining to 92 to 93% in 1990 with domestic linerboard prices dropping to the $350 level by second-quarter 1990.

Even some industry executives have admitted to more difficult times ahead. Box converters can expect better margins because of "the substantial amount of containerboard capacity coming onstream over the next three years," Victor A. Casebolt, senior vice president of International Paper Co., told the Assn. of Independent Converters last fall. Nevertheless, he expects operating conditions to be good, with a "better balanced and more stable" market than during the tight 1986-88 period.

STILL SOME OPTIMISTS. One company that remains optimistic is Stone Container Corp., which last fall advised customers to expect a $30/ton price in-

crease this March on linerboard and kraft paper. "Linerboard list prices will then reach $440/ton, a price considerably below the $500/ton level we feel must be attained in order to justify a new greenfield mill expansion," the company said in a letter to customers.

New longer-range opportunities for linerboard producers will also open in 1990. The market for white linerboard grades offering better printing quality for visual appeal boxes seems to be taking off, according to a new *Pulp & Paper Forecaster* report. Demand for white linerboard will grow 6%/year over the 1988-92 period, with the fastest growth in white-top grades, said its author, Coleman Rowland of Lakeway Research. "High-performance" containerboard is also expected to show rapid growth and may account for 30% of total production by 1992, according to the report.

As a result, linerboard may become less of a commodity. And the companies that have invested to reduce costs and improve product quality should be in a stronger position if the market does turn down.

BOXBOARD

STEADY GROWTH TREND EXPECTED

■ Producers of bleached, unbleached, and recycled boxboard grades should enjoy steady demand for these paperboard packaging grades in 1990. Solid bleached sulfate (SBS) capacity additions will be limited to incremental machine rebuilds during the year, so supply and demand should remain in balance and operating rates should remain at 96% through the end of the year. A large addition of coated kraft board capacity in late 1990 could lead to excess market supply in early 1991.

Production of bleached board increased only 1% in 1989, following a 2% increase in 1988. Capacity increases have averaged only 1.1% annually during the past ten years, so the bleached board industry has been capacity constrained for the past two years. Producers have dedicated virtually all available machine capacity to bleached board production and produced fewer than 5,000 tons of bleached pulp in 1989, according to industry reports. Still, demand exceeds domestic supply, but Canadian suppliers have moved rapidly to fill the gap.

Tembec Inc., Montreal, Que., hopes to fill this niche when it starts up a new 140,000-metric-tpy, three-ply coated solid bleached board machine in early 1990. The new paperboard operation at Temiscaming, Que., is a joint venture with Jefferson Smurfit Corp. Smurfit will also be one of the primary purchasers of the board, which is expected to compete with SBS. Last year, Cascades Inc. began producing a similar double-white, three-ply folding carton board that has replaced SBS in a number of packaging applications.

Recycled paperboard production was down about 2% last year, largely as a result of an 8% decline in gypsum wallboard production. Output of the recycled packaging grades, including folding carton, was up about 3%. Recycled mills producing folding carton stock reported strong orders throughout the year due to the shortage of SBS board and the increasing price differential with SBS. At the end of 1989, 15-pt coated SBS was selling for approximately $830/ton, while 20-pt clay-coated newsback (CCN) was selling for about $480/ton and coated kraftback for about $510/ton.

Unbleached kraft folding boxboard, which accounts for about 18% of the folding boxboard market, increased about 9% last year. Most of the coated kraft board produced by Mead Corp. and Manville Corp. is used in the beverage carrier market, where the increased use of multi-packs and exports has spurred growth. At the same time, both producers have expanded their folding carton businesses to replace SBS and CCN. Coated kraft board prices fall between these two grades, and 20-pt folding carton stock sells for $615 to $620/ton.

HAVE PRICES PEAKED? Following two $50/ton SBS price increases in 1989, Merrill Lynch's Evadna Lynn expects only one price increase this year, in the fall. Westvaco Corp. and Federal Paper Board Co. will each start up new paper machines in 1992, but until then only incremental SBS capacity expansion is planned. Milk carton exports, which have averaged about 13% of total production in recent years, should keep pace because International Paper Co. and Potlatch Corp. will be increasing capacity to produce liquid packaging.

IP forecasts worldwide demand for liquid packaging board to grow 4.3% annually to over 2 million tons by 1995.

Recycled boxboard producers did not raise prices in 1989, although most producers pushed through three price increases in 1988, each averaging about $30/ton. As a result, prices for newsback and kraft-back board remained firm.

Producers saw wastepaper fiber costs steadily diminishing during the year, which offset the need for a price increase. Boxboard prices vary $10 to $15/ton for producers located in different regions of the country based on different wastepaper costs. Prices also vary by the basis weight and quality of the multi-ply boards manufactured by different producers. Recycled chipboard and converting boxboard prices remained largely unchanged last year, averaging between $340 and $360 tons for 20-pt bending chipboard grades.

NEW KRAFT MACHINE. Mead is on schedule to start up a new 360,000-tpy coated unbleached kraft paperboard machine in late 1990 at the company's Mahrt mill near Phenix City, Ala. Mead's coated board division plans to market much of the machine's output overseas, but domestic markets will not be overlooked. Growth

rates for this boxboard grade have outstripped both SBS and recycled grades in recent years, and coated kraft folding carton board has found a good niche between the two competing grades. Of course, Tembec also hopes to capture some of these same niches. Both Mead and Manville raised coated kraft boxboard prices last year, and they should be able to raise prices again this year if demand stays firm. Some potential exists for market oversupply at the beginning of 1991, but Mead has announced that if the new machine's output is not entirely sold, the company could produce lightweight linerboard on the same machine.

WASTEPAPER

OLD NEWSPAPERS GLUT MARKET

■ The most remarkable characteristic of paperstock markets in 1989 was that some of the low grades no longer behaved as one would expect if just supply and demand were taken into account. Why? Because a growing number of states and municipalities passed legislation mandating separation and collection of old newspapers.

About 20 states will have laws on the books by the end of this year requiring residents to separate ONP from their trash in an effort to cut down on the volume of trash entering landfills. Many politicians fail to grasp that mandatory collection does not mean recycling since mills can use only so much ONP. Far fewer bills have been passed requiring ONP to be used in specific end uses, such as newspapers. Two federal laws introduced late last year would require a certain amount of ONP to be used in newsprint production, and they will be taken up again this year. At the end of last year, only three states had laws on the books to stimulate demand for ONP, and all of these were focused on newspaper publishers.

The advent of mandatory collection laws caused the transaction price of ONP to enter negative numbers in some parts of the country. For example, the price of ONP in the Northeast during last October was −$25 to $5/ton. The mountains of ONP in that region, where mandatory collection in the U.S. started, has caused some paper companies to announce that they are studying the possibility of building mills to use up the resource. Among these are Jefferson Smurfit Corp. and Garden State Paper Co.

The weak ONP market has dragged down the price of boxboard cuttings. Mills that formerly used this grade are using ONP instead so they can help their communities use up the ONP. Similarly, mills that once used new double-lined kraft corrugated clippings are using more old corrugated containers (OCC) in an effort to keep this postconsumer paperstock grade out of the landfills.

Deinking grades exhibited the strongest demand of any paperstock grade in 1989, and this trend is expected to continue in 1990. Mills that were loathe to pay historically high prices for pulp substitutes traded down to deinking grades. In addition, an estimated 40% of fiber consumed by tissue mills in the U.S. is secondary fiber. Tissue demand will not fall off as sharply as commodity grades of paper during an economic downturn. Demand for deinking grades is forecast to remain strong in 1990.

Also, a plethora of printing/writing paper producers are studying the use of postconsumer grades of paperstock to make a recycled sheet of paper suitable for use in office copiers and computers. Nekoosa Papers Inc. introduced a 50% recycled content xerographic sheet last fall. Others studying such projects include a joint venture between Cascades Ltd. of Canada and Steinbeis of Fed. Rep. Germany (*P&P*, Nov. 1989, p. 39), Domtar Inc., and James River Corp., Halsey, Ore. (*P&P*, Nov. 1989, p. 29). Hammermill Paper Co. introduced a recycled copier paper last October, but unlike Nekoosa's, the paper contains preconsumer wastepaper grades. These projects will use mainly high-grade deinking stocks and possibly some pulp substitutes, although Steinbeis reportedly can make its computer printout paper out of 100% ONP.

As one might expect, the price of pulp substitutes mirrors that of woodpulp. Discounting of hardwood pulp began in the third quarter of last year and continued through the end of the year. A corresponding drop in the price of pulp substitutes was observed. Prices for pulp substitutes are not expected to show much upward movement during the first half of 1990.

A discussion of U.S. paperstock markets is not complete without noting what is happening on the export market. An economic slowdown in the U.S. means U.S. consumers will be less likely to buy goods from Japan. This, in turn, will cut down on Japan's need to import OCC from the U.S. to make boxes to ship these goods to the U.S. The export market to the Far East is traditionally slow during the beginning of the year because that is when the Chinese New Year is celebrated. Additionally, the unrest in People's Rep. China and that economy's dire straits will continue to curtail wastepaper demand. Rep. Korea recently brought online a number of deinking lines, so demand for manifold white and colored ledger will be bolstered. And Mexico should continue to exhibit healthy demand for OCC in 1990 since new recycled linerboard capacity has come onstream.

For more information on the U.S. wastepaper market and the effects of mandatory recycling legislation, attend "Wastepaper I: Demand in the '90s." Sponsored by Pulp & Paper magazine and Pulp & Paper Week, the conference will be held May 14-15 at the Westin Hotel, Chicago, Ill. Contact Bill Rutledge at (415) 995-2472 to register.

CANADIAN INDUSTRY

COMPANIES BRACED FOR YEAR OF LABOR TALKS, LOW PROFITS, AND SHUTDOWNS

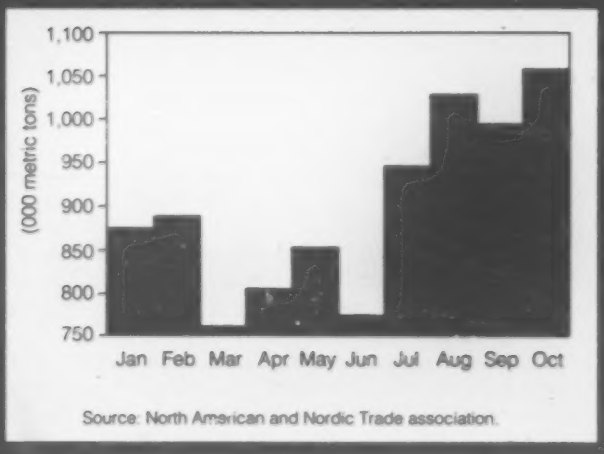
The year ahead will be a tough one for the Canadian industry. Already suffering from the pounding taken from exchange rates and eroding newsprint markets, producers are gearing up for further deterioration in other sectors, such as market pulp, and are hoping the U.S. economy doesn't slide into a recession later in 1990.

Canadian industry earnings were on the downside for most of last year. Beginning with severe deterioration in newsprint profits, the erosion crept into virtually all sectors by year-end 1989. Weaker markets were reported by third-quarter 1989 in paperboard, packaging products, and white paper, as well as in hardwood kraft pulp. Market pulp, perhaps the industry's greatest asset in 1989, could be the grade hardest hit this year.

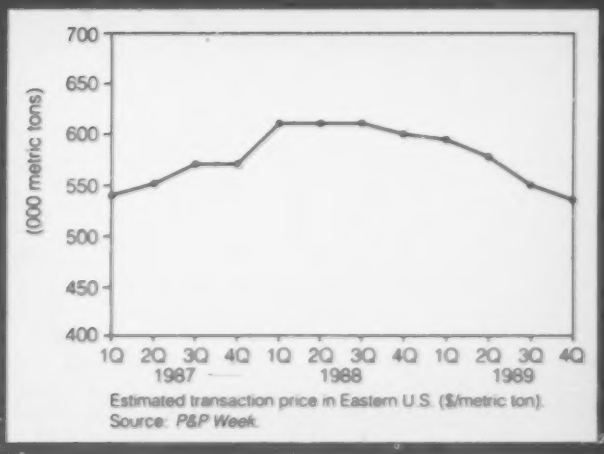
Shipments from Canada were severely affected in 1989 by a stronger Canadian dollar. Through the first nine months of 1989, the Canadian dollar averaged US84¢ compared with US81¢ in the same period of 1988. A one-cent increase in the value of the Canadian dollar against its U.S. counterpart costs a company like Noranda Forest Inc. C$9 million after taxes and costs Fletcher Challenge Canada Ltd. C$6 million, according to Price Waterhouse.

Canadian companies, though, have been responding to increased competition by upgrading old facilities, building new mills, and shutting down or converting older and less efficient machines. Capital spending plans are likely to be curtailed somewhat this year as the industry's cash flow is squeezed. "The difficulty will be in finding internal and external sources of cash to fund them," noted Brian Topp, forest products analyst with Capital Group Securities, Toronto, Ont. He expects Canadian earnings will be halved in 1990 and that operating rates will drop across the board, with pulp about 92% and newsprint in the low 90% area.

SPENDING MAY BE CURTAILED. Major expansions and modernizations already under way should not be



Source: North American and Nordic Trade association.



Estimated transaction price in Eastern U.S. ($/metric ton).
Source: *P&P Week*.

affected by curtailment of spending. As a result, capacity in such grades as newsprint and printing/writing will expand substantially in a short time. According to the Canadian Pulp & Paper Assn.'s most recent capacity survey, printing/writing capacity will increase 41.3% over the period 1988-91. During this time, newsprint capacity will rise a less substantial 14.7% but will involve the addition of nearly 1.5 million metric tons.

In 1990, Canadian companies should continue substantial spending on foreign capital projects and acquisitions. Joint ventures have added viability to some of these investments by combining companies' skills in technology and marketing as well as by pooling finances. Cascades and Steinbeis Group of Fed. Rep. Germany, for instance, have joined together on a recycled printing/writing mill to be sited somewhere in eastern Canada or the northeastern U.S.

Cascades Inc. and other Canadian companies have also invested in other markets. Abitibi-Price Inc. has newsprint projects under way in the U.S. (in partnership with Parsons & Whittemore Inc.) as well as in Venezuela (in partnership with Bowater Inc.), Scotland (North British Newsprint Ltd.), and the U.S.S.R.

Canadian producers have become increasingly concerned about global markets in recent years as nontraditional suppliers have increased capacity. In addition, trade agreements worldwide have changed markets. The Canada-U.S. Free Trade Agreement is not expected to have a significant effect on Canadian producers in the near term. The opportunity provided by the agreement for improved access to U.S. markets for printing and writing paper is partially offset by the need to restructure some Canadian companies' domestic operations in the face of increased competition in the Canadian market.

In Europe, Canadian companies have sought investments to assure future access and a competitive position relative to European suppliers. This positioning will become a bigger concern as the European Community gets ready to tear down trade barriers and unite the Common Market in 1992.

EXCHANGE RATES A PROBLEM. The weakening of the U.S. and Canadian dollars in relation to other major currencies improved Canadian producers' competitive positions in overseas markets in recent years. However, this improvement was more than offset by decreased realizations from Canadian sales in U.S. dollars as the Canadian currency strengthened last year. The chief commodities affected were pulp and newsprint.

Export opportunities for pulp and paper shipments are expected to shrink in 1990 due to the stronger Canadian dollar. Many industry observers expect the Canadian dollar will remain at about US84¢ U.S. this year. Overseas expansions in newsprint and other grades will reduce demand for imports in such key markets as Europe. Pacific Rim markets will remain good, however.

Another issue Canadian mills will grapple with in 1990 is increasing environmental concerns. Concern over dioxins has already resulted in Canadian pulp producers committing millions of dollars to upgrading operations, such as adding oxygen delignification equipment. The issue of a dwindling forest base has also taken hold across Canada but has been most vocal in the West.

ENVIRONMENTAL ISSUES SURFACE. In Alberta last year, citizens groups slowly began to fight the bevy of mill expansions being considered over the next few years. One or more of six projects may be shelved, and others have been delayed by more stringent and timely government review processes. MacMillan Bloedel Ltd. began a campaign in British Columbia to inform the public of its forest management practices. Other provinces are also taking a closer look at forest management agreements.

The Canadian industry will also be investigating ways to add recycled fiber capacity at mills—particularly those producing newsprint—as U.S. legislation aimed at requiring greater use of recycled newsprint and other grades is expected to become more widespread in 1990 and 1991. This will be a key problem for the industry, as many mills are in remote areas. Shipping wastepaper great distances—particularly to mills surrounded by abundant pulpwood supplies—may prove unfeasible.

One of the most prominent items on the Canadian industry's agenda for 1990, though, is labor negotiations. Contracts covering the majority of mill workers in eastern Canada are due to expire on April 30. It appears the chances of a prolonged strike are very good.

LABOR TALKS COULD BE HEATED. Modest net profits will give companies more leverage in labor bargaining in 1990, though eastern Canadian unions may be determined to bring their wage increases back in line with those negotiated in recent years in British Columbia, noted Topp. He expects the unions will want 6% to 7% wage increases.

Ross Hay-Roe, analyst with McCarthy Securities, Vancouver, B.C., expects companies may actually prefer to shut down for awhile "given the current state of the mills' profitability, their own inflated inventories, and the industry's morbid focus on all the new capacity starting up."

If strikes would, in fact, provide an opportunity to work off inventories, mills will probably take advantage of it. Canadians took the brunt of the downtime in 1989. Newsprint mills alone took over 200,000 metric tons off the market last year, with most of this occurring in eastern Canada in first-half 1989. Kraft sack and fine paper producers also curtailed operations, though not as significantly. More downtime is expected in 1990, and it is likely to affect more sectors more significantly than last year.

NEWSPRINT

SLUGGISH DEMAND AND EXCESS SUPPLY

■ North American producers are gearing up for a third consecutive year of lackluster returns in the newsprint business. Profits, which have been on a downward slope since late 1988, should continue in that direction through much of 1990. Newsprint prices are expected to drop even further, leading to more production curtailments, machine conversions, and permanent closures.

Late in 1989, market observers were not prepared to say the worst was over. As one sales executive noted, "If you think this is bad, wait till it gets worse." In 1989, newsprint downtime in North America amounted to over 200,000 metric tons. Virtually all of this downtime was taken by mills in eastern Canada, which has a greater number of older mills than other regions of North America.

The cost to manufacture and deliver a ton of newsprint produced in Canada in 1989 averaged about $474/metric ton, compared with $405 in the U.S. West and $418 in the U.S. South. (These figures are 1989 estimates based on a newsprint cost study updated in 1988 by the Forest Sector Advisory Council of the Canadian government.) In addition, a stronger Canadian currency further reduced returns from sales denominated in U.S. dollars.

With average transaction prices for newsprint delivered to U.S. East markets dropping to $540/metric ton by late 1989, some high-cost producers began to lose money. Newsprint prices have been dropping since mid-1988 and are expected to continue falling in 1990. Most industry observers are calling for the slide to level off at about $500/metric ton, and they don't expect another price increase until 1991.

Many market observers did not anticipate the newsprint market would deteriorate as rapidly as it did in 1989. It was especially surprising considering operating rates stayed above 95% throughout most of the year. However, the expectation of rising North American newsprint capacity later in 1989 through 1991 led to increased discounting. By the fourth quarter, average discounts were in the high teens, and the largest buyers were getting more than 20% off of the $650/metric ton list price in the U.S. East.

Morgan Stanley analyst Jeanne Carroll estimates that newsprint transaction prices will fall to about $523/metric ton in 1990. As a result, North American newsprint producers' profit margins, on average, will fall by 95% between 1989 and 1990 to just $7/metric ton.

The average operating profit of Canadian companies (before interest expense and income taxes) will probably decline 40% from C$130 to $40/metric ton in 1988 to C$80 to $90/metric ton in 1989 and drop even further in 1990, according to Jim Rowland, editor of *Canadian Paper Analyst*. Unanticipated strength in the Canadian dollar vs the U.S. counterpart could lead to an even larger percentage decline, he noted.

Brian Topp, forest products analyst with Capital Group Securities, projects another 5% drop in newsprint prices in first-half 1990. Newsprint producers are most liable to be under pressure from publishers to drop prices early in the year, when their profit margins will be squeezed the most, noted Topp.

However, Ross Hay-Roe, industry analyst with McCarthy Securities, expects actual prices to remain fairly stable in the first half because of increased demand. Publishers will rebuild inventories as a hedge against possible strikes in eastern Canada. Labor contracts covering most mill workers in that region expire on April 30, and some industry observers feel the chances of a prolonged strike are high.

Hay-Roe indicated that the newsprint industry has already seen the worst from the current down cycle. He expects inventory rebuilding by publishers alone should boost consumption by 425,000 metric tons in 1990. At the same time, capacity increases previously slated for early in the year have been delayed until mid-year or later, and one startup was pushed back until 1991.

The Canadian industry will continue to invest in a number of new machines in the next two to three years. At the same time, many older machines will be shut down. Some announcements of machine shutdowns were made in 1989, and more are likely to follow in 1990. The older and less efficient machines that are not idled are likely to be converted to groundwood specialties.

However, in the near term, the Canadian newsprint industry is expected to be in a period of declining profits. Substantial downtime will occur in second-half 1990, unless significant losses in production result from strikes or other causes. Even U.S. producers, relatively untouched by curtailments in the current market downturn, will take some downtime to control inventories.

North American operating rates will average 89.9% in 1990, down from an estimated 95.9% in 1989 because of a 2.8% rise in capacity in 1989, followed by a 7.5% increase in 1990 and a projected boost of 2.5% in both 1991 and 1992, according to Morgan Stanley projections. "The average newsprint producer might very well operate in the red in 1991," noted Carroll. "Of 21 companies followed by Morgan Stanley, only Bowater [Inc.] . . . enjoys a significant cost advantage, with operating margins at 24.4% in 1988 compared with the average of 19% to 21%."

Jaak Puusepp of Pemberton Securities, Vancouver, B.C., expects newsprint operating rates to drop to about 90% in 1990 and hover there until about 1993. North American exports to Europe will not grow significantly during this time because European capacity will also be

increasing rapidly. Opportunities for exports to the Pacific Rim, though, remain good.

Besides normal market factors of demand and supply, the newsprint industry will have to cope with increasing pressure to add deinking capacity. As more laws requiring publishers to use recycled newsprint are adopted in 1990, producers will be forced to take action to protect market share.

In 1989, virtually every North American newsprint company was already weighing solutions to the recycling problem. Many announcements of capital investments in deinking equipment are expected in 1990. Companies such as Garden State Paper Co. and Smurfit Newsprint Co. are selecting sites in the northeastern U.S. for greenfield newsprint mills, and numerous others will look at ways to incorporate recycled fiber into existing facilities.

Only about 9% of current North American newsprint output is made from recycled fiber. The U.S. industry is comparatively in a much better position, with about 22% of its capacity using wastepaper, while Canadian recycled newsprint capacity is only 2% of the total. Canadians are also in the worst position to add recycling facilities, as most mills are in remote areas surrounded by timberlands. Transporting wastepaper to these regions will be costly. In the U.S., however, mills may encounter problems in obtaining necessary permits.

UNCOATED GROUNDWOOD

NEWSPRINT SOFTNESS AFFECTING LOW END

■ Softness in the bloated newsprint market is causing low-end uncoated groundwood paper to suffer as well, and overcapacity in coated groundwoods is helping make pricing more competitive in the high-end supercalendered (SC) grades.

In fact, future demand for newsprint and groundwood-based uncoated publication paper grades will be constrained by a slowdown in general economic growth, said Christian Wijnberg, vice president at Salomon Bros.

"Even if future growth in general economic activity exceeds our expectations, there are a number of factors specific to groundwood and newsprint which will constrain future growth," Wijnberg said.

Prospects for groundwood paper are mixed because of increases in postal rates and efforts by newspapers to provide more targeted audiences for their customers, which will have a negative influence on demand from direct mail customers, Wijnberg explained.

In 1988, about 10% of paper consumed for direct mail in the U.S., including catalogs, was uncoated groundwood, according to Andover International Assn. Uncoated groundwood also represented about 31% of paper used in free-standing inserts.

SC PAPERS CONTINUE STRONGEST GROWTH. John Maine, vice president—printing and writing paper at Resource Information Systems (RISI), projects demand for groundwood paper to grow about 1.5% in 1990, after a 0.4% drop in 1989.

John G. Davis, executive vice president of the Printing Papers Group at Abitibi-Price Inc., suggested the following growth rates in the next five to ten years for uncoated groundwood paper:

- Directory paper, 2% to 4%/year
- Forms paper, 3% to 5%/year
- Machine-finished groundwood paper, decline of 2% to 5%/year
- "Smooth" paper (primarily SC), 8% to 10%/year.

RISI's Maine sees generally good prospects for SC growth in catalogs, inserts, and other segments. He also expects continued growth in directory paper. Maine also predicts a renewed emphasis on groundwood forms, including some based on recycled fiber.

Stone-Consolidated's mill in Grand'Mère, Que., will produce the only major capacity due onstream in 1990 in North America. The new machine, which has a soft calender, will produce approximately 183,000-short tpy of uncoated groundwoods. Theoretically, the new machine is designed to make anything from rotonews to high-grade SC. Another 77,000 tpy of unfilled or low-filled SC will be available through conversion from newsprint at Kruger Inc.'s Corner Brook, Nfld., mill. Lake Superior Paper Industries has postponed the addition of a second 240,00-tpy SC-A machine for the time being.

EUROPEAN CAPACITY ALSO A FACTOR. The oversupply of newsprint and coated paper that will affect uncoated groundwood is also occurring in Europe. Slowing demand has also cut imports to the U.S., which may exacerbate the European situation.

Maine said U.S. mills will have about 48% of the U.S. groundwood market in 1990, down slightly from 1989 when the full impact of new capacity was felt from Lake Superior's SC machine in Duluth, Minn. Canada will boost its share from 39% in 1989 to 42% in 1990. European producers will drop from 11% in 1989 to 10% in 1990.

The European Paper Institute's (EPI) *Paper Capacity Report for Woodcontaining Publication Papers in Reels* indicates that from 1988 to 1993, SC magazine will advance 1%/year while other uncoated grades will grow at 5%/year for the next five years. Perhaps a more important factor will be the burgeoning newsprint and coated paper markets, which are likely to drop substantially under 90% utilization in 1990.

Increased demand in markets using SC magazine paper is also encouraging capacity expansion in that area, though operating rates are expected to be 93.3%, down from 95% in 1989. Utilization will drop to 90.5% in 1991.

Few new SC projects are under way or planned and capacity will rise from about 3.021 million metric tpy in 1988 to 3.310 million metric tpy in 1993, according to EPI. Potential projects could add another 300,000 metric tpy if they proceed.

The balance of uncoated wood-containing paper represents a small portion of the market. Capacity growth in this area is relatively minor, and operating rates will be approximately 94.4% in 1990, down from 104.2% in 1989. Operating rates are projected to fall further to 91.2% in 1991.

Capacity will rise from 1.031 million metric tpy in 1988 to 1.413 million metric tpy in 1993, EPI says. The growth comes through speedups, changes in product mix, and other factors.

MARKET PULP

AFTER THE PARTY IS OVER

■ The three-year run-up in pulp prices enabled pulp producers to achieve record prosperity in 1989. Now North American producers have their fingers crossed that they can get through 1990 with only moderate erosion in prices and not the collapse some forecasters are predicting.

Market pulp demand began to weaken last year as papermakers, first in the U.S. and then in Europe and Japan, began to reduce pulp inventories. Meanwhile, North American and Nordic producer pulp inventories began to climb, hitting 1.06 million metric tons by the end of October, up from the low of 666,000 tons at the end of 1988. The total number of North American and Nordic pulp shipments was expected to decline approximately 1% last year, with shipments to the U.S. down about 5%.

All of the classic early symptoms of a market downturn began to appear in pricing by the fourth quarter: increased availability of supposedly off-spec pulp, fairly open discounting ($15 to 30/ton) on southern mixed hardwood and pine on the lower end of the quality spectrum, and more aggressive discounting of all types of pulp in more out-of-the-way Mediterranean and Third World markets.

Nevertheless, only minor discounting was reported off the benchmark northern bleached softwood kraft pulp price of $840/metric ton ($830 domestic) in major world markets, and there was some hope producers would be able to at least hold list prices in first-quarter 1990. Among causes for optimism were a weakening dollar, which opened a wide gap with local currency prices in Europe, downtime announcements by Nordic and some eucalyptus producers, and some pickup in U.S. printing/writing paper production following an inventory reduction that depressed demand through most of last year.

BULGE OF NEW CAPACITY. Most analysts, however, expect pulp prices to drop in 1990 due to slower economic growth, startup of new capacity, and increased substitution of pulp by wastepaper and fillers. Major pulp expansions scheduled to be completed this year include Weyerhaeuser Paper Co.'s new 350,000-tpy line at Columbus, Miss., and Daishowa Forest Product's 340,000-tpy line at Peace River, Alta. World chemical paper-grade pulp capacity growth is expected to pick up from 1.4% in 1989 to 3.0% in 1990 and 3.1% in 1991, with even higher growth likely in 1992-93 when several greenfield mills in Latin America begin to come online.

In addition, two more Canadian bleached chemithermomechanical pulp (CTMP) mills (Donohue-Matane and Alberta Energy) will start up later this year. These two mills would bring the total amount of new CTMP capacity added in Canada over the 1986-90 period to more than 1 million tpy. The new CTMP producers are expected to price fairly aggressively to develop markets for their new pulp, particularly in printing/writing paper markets.

HOW DEEP A DOWNTURN? Rodney Young of Resource Information Systems (RISI) expects the price of northern bleached softwood kraft to bottom at about $680/metric ton in the first part of 1991—a relatively optimistic forecast based on slower economic growth (but no recession) and further weakness in the dollar (projected to decline to DM 1.7).

RISI expects world shipments/capacity of chemical paper-grade market pulp to average 91% in 1990, compared with 97% to 98% for the mid-1986 to mid-1989 period. With shipments forecast to be about 7% lower than what the industry can actually produce, about 2 million tpy of capacity will have to be shut down to bring the market into balance. "Normally, the way this occurs is that prices have to come down to the cost levels of producers in the higher cost countries, such as Scandinavia, northern Europe, and Japan, which are then forced to shut down."

The weaker dollar would provide a much higher floor for dollar pulp prices than existed in the 1985 market downturn, Young notes. However, if the dollar remained strong (for example, DM 1.9), "our dollar price forecast would be considerably lower." RISI expects market pulp demand to rebound in 1991-93, with shipments rising 6%/year helped by strong growth in printing and writing paper and tissue, particularly in Europe and Japan.

A recent forecast by Robert Bishop and Sherman Chao of Salomon Brothers reflects how far pulp prices could fall if the dollar does not weaken. They estimate pulp prices will fall at least $300/ton by the end of 1991, with northern bleached softwood kraft hitting $520/ton before higher-cost capacity is shut down—based on constant exchange rates (before late November's weakening in the dollar).

LABOR

THE 1990s: ERA OF CONCILIATION

■ Labor/management relations during the 1990s in the U.S. pulp and paper industry are expected to focus on job security, health and retirement benefits, work rule flexibility, and moderate wage increases. Strikes may be a thing of the past in the wake of the United Paperworkers International Union's (UPIU) unconditional end to a 16-month strike against International Paper Co. in October 1988. In 1989, only one strike occurred: UPIU members at Little Rapids Corp., Potsdam, N.Y., have been on strike since March 1989. The company hired 80 permanent replacement workers to run the facility. The threat of permanent replacement will curtail the unions' willingness to strike.

Companies continue to phase out premium pay for Sunday and holiday work. The practice of giving lump-sum payments in the first year of the contract is now practically an institution among the larger companies, enabling paper companies to curtail their unit labor costs (*P&P*, Sept. 1989, p. 244). And companies in 1990 will continue to try sharing health care costs with their hourly employees. Standard contract length is about three years. More contracts are being negotiated for four and five years than for one and two years—a reversal of historical trends.

Wage increases through the first nine months of 1989 averaged 1.0% in the first year, 2.5% in the second year, and 2.5% in the third year, according to American Paper Institute statistics. This compares with a median first-year wage increase of 3% for collective bargaining settlements in manufacturing industries, according to the Bureau of National Affairs. But it is better than 1988, when average increases were 0.7%, 2.0%, and 2.1%.

UPIU has been looking for other bargaining strategies, since striking has gotten it nowhere. It tried the concept of pooled voting—several locals working for one company decide at the outset that certain issues (such as premium pay) would be subject to a majority ratification vote by all the locals. UPIU tried to use this strategy against IP, Champion International Corp., and Georgia-Pacific Corp. Last fall, Region 3 of the National Labor Relations Board (NLRB) ruled that a complaint should be issued against UPIU and against locals of the International Assn. of Machinists and the Firemen & Oilers for their use of pooled voting against Champion. Champion charged the unions had bargained in bad faith and threatened multiple strikes.

Union members still can try the "if you can't beat 'em, join 'em" approach. Employee involvement in work teams and more autonomy for work units will become more common and may provide employees with more satisfying jobs and companies with more profitable mills.

IP STRIKE EPILOGUE. International Paper Co. and Local 14 of UPIU began negotiating the terms of a new three-year contract about a year after the union unconditionally ended a 16-month strike at the mill. Talks initiated by the company began Oct. 16, 1989. IP is seeking to amend and extend provisions under the contract proposals it implemented in October 1987 and is also offering wage and benefit increases. About 1,150 hourly workers are employed at the mill, and 110 of those are strikers who have been rehired. UPIU's counterproposal seeks a reinstatement of premium pay for Sunday and holiday work—the issue that caused the strike.

The permanent replacement workers hired to run the Jay, Maine, mill during the strike have filed a decertification petition, but until all charges of unfair labor practices filed by the union against the company have been settled, no vote on union decertification can occur. Replacement workers at IP subsidiary Nicolet Paper Co. in De Pere, Wis., voted 316 to 2 not to be represented by UPIU Local 6268. Although the vote occurred Sept. 14, 1988, the votes were not counted until Oct. 17, 1989, because of pending unfair labor practice charges. The only people eligible to vote in the election were replacement workers.

Meanwhile, last fall, four UPIU locals employed by IP mills at Pineville, La., Kaukauna, Wis., Merrill, Wis., and Ticonderoga, N.Y., were attempting pooled bargaining. The locals also filed a charge of unfair labor practices against IP with NLRB and said they have a right to coordinate their efforts. (NLRB had not ruled in the matter by press time.)

NEGOTIATIONS IN EASTERN CANADA. On Apr. 30, 1990, the three-year contract covering members of the Canadian Paperworkers Union (CPU) in eastern Canada will expire. The last contract was settled without a strike, but it is not certain the same will be true of this round. Some of the companies in eastern Canada, like Abitibi-Price Inc., are suffering from weak newsprint markets and will be reluctant to agree to large wage increases while the industry is trying to absorb new capacity coming onstream during 1989-91. (Abitibi is usually the company that CPU negotiates with first, and the contract agreed upon is then used as a pattern for the rest of the industry.) Last fall, Domtar Inc. announced it was cutting 500 salaried positions, partly because it has sold off its chemical division. But a company doing this kind of belt tightening is not likely to be generous at the bargaining table.

In contrast, CPU has signaled it wants a wage increase of 5.5% in the first year, which is the same increase union members in western Canada will get in 1990 under their contract. (The contract in the West expires in 1991.) During the last contract negotiations, CPU members in eastern Canada agreed to lower wage increases than their counterparts in the West and may feel they have to even this score.

Irving Pulp & Paper Ltd., Saint John, N.B., settled a new contract with CPU in October 1989, and national CPU leaders were involved in negotiations, so the contract settled provides a hint of what CPU may be trying for in all of eastern Canada. In addition to the 5.5% wage increase, CPU may be asking for 4% vacation pay. For every week of vacation taken, union members would be paid 4% of their gross wages from the previous year. Another way of looking at it is that union members will receive about two weeks' pay for every week of vacation.

TABLE 7: **Major contracts by region on 1989 bargaining calendar of U.S. paper industry.**

Company	Mill location	Union	No. of employees	Contract expires
Southern region				
Fulltown				
Paperboard	Hartown, W.Va.	O	102	1/31
James River	Richmond, Va.	U	77	4/28
ITT Rayonier	Jesup, Ga.	U,B,A,O	896	6/30
Jefferson Smurfit	Jacksonville, Fla.	U,B	352	6/30
Union Kraft	Macon, Ga.	U,B,A	462	8/28
Champion				
International	Canton, N.C.	U	1,482	8/31
Hammermill Paper	Pine Bluff, Ark.	U,B	951	8/31
Georgia Pulp				
& Paper	Lockport, La.	U	123	9/03
Owens Packaging	Valdosta, Ga.	U,B	365	9/15
Inland Container	New Johnsonville, Tenn.	U	139	10/31
New England region				
Madison Paper				
Industries	Madison, Maine	U	235	4/30
Champion				
International	Bucksport, Maine	U,B,A,O	1,042	5/01
Potlatch Paper Div.	Naples, Maine	U	82	5/31
Inland-				
Paperboard	Haverhill, Mass.	U	114	6/01
S.D. Warren	Westbrook, Maine	O	1,258	6/01
James River	Berlin, N.H.	U	1,248	6/24
Boise Cascade	Lawrence, Mass.	U	97	6/30
Independence Paper	Turners Falls, Mass.	U	94	6/30
	Westfield, Mass. and Westbrook, Maine	U	415	6/30
Scott Paper	Mexicana, Conn.	U	160	7/10
New Northern				
Paper	Milinocket,	U	1,184	
	E. Millinocket, Maine			
	Millinocket	S,A,O	828	
	E. Millinocket, Maine			
James River	Old Town, Maine	U	238	7/31
	Fort Hill, Mass.	O	23	8/08
James River	E. Pownal, Maine	U	114	8/21
Boise Cascade	Rumford, Vt.	U	180	8/31
Pacific region				
Georgia-Pacific	Toledo, Ore.	W	430	1/01
Boise Cascade	Boardman, Ore.	U,W	420	3/01
Crown Zellerbach	St. Helens, Ore.	W	453	3/15
Boise Cascade	Wallula, Wash.	U	348	3/15
Boise Cascade	Salmon, Idaho	W	310	3/15
Boise Cascade	Cascade, Idaho	W	272	3/15
Crown Zellerbach	Camas, Wash.	W	180	3/15
Georgia-Pacific	Bellingham, Wash.	W	630	3/15
Georgia-Pacific	Halsey, Ore.	W	180	3/15
Georgia-Pacific	Albany, Ore.	W	440	3/15
Georgia-Pacific	Toledo, Ore.	W	230	3/15
Georgia-Pacific	Coos Bay, Ore.	W	270	3/15
Georgia-Pacific	Vancouver, Wash.	W	440	3/15
Weyerhaeuser	Longview, Wash.	W	1,200	3/31
Weyerhaeuser	Everett, Wash.	W	350	4/01
Weyerhaeuser	Springfield, Ore.	W	180	4/01
Weyerhaeuser	Klamath Falls, Ore.	W	180	4/01
Weyerhaeuser	Grays Harbor, Wash.	W	1,100	4/01
Weyerhaeuser	Longview, Wash.	W	1,200	4/01
Weyerhaeuser	Springfield, Ore.	W	180	4/01
Weyerhaeuser	Klamath Falls, Ore.	W	180	4/01
Weyerhaeuser	Grays Harbor, Wash.	W	1,100	4/01

REGULATIONS

SURVIVING IN A "GREEN" DECADE

■ The health of the environment is becoming more important to North Americans, and the paper industry will spend more time and money improving its pollution control processes and, more importantly, explaining to the public what it is doing to improve those processes. Ely Gonick, senior vice president of International Paper Co., noted at Resource Information Systems' (RISI) annual conference last November that the paper industry is "particularly vulnerable to criticism in the environmental arena because it cuts down trees; paper is the largest component of waste in the municipal dumps; the industry uses herbicides and insecticides; and it disposes of byproducts in streams and landfills." Siting a new bleached kraft pulp mill is now a matter for public scrutiny, as Noranda Forest Inc. and Alberta-Pacific Forest Industries Inc. learned in Tasmania and Alberta, respectively, last year.

AIR. The Bush Administration introduced a bill to amend the 1977 Clean Air Act in mid-1988. Congress has been planning to revise the bill since 1987 and may succeed since the current administration says it is more disposed to pass such legislation than the Reagan Administration was. The proposed bill would have the greatest impact on the pulp and paper industry in the areas of acid rain and air toxics.

The acid rain provisions mainly target coal-burning utilities in the Midwest, which will have to reduce emissions of sulfur dioxide. These provisions require mills to add scrubbers or switch to cleaner-burning fuel, both of which will lift the cost of electricity to industry. Industry will be required to monitor air discharges of almost 200 hazardous chemicals and will be subject to fines and criminal penalties. Although the bill has not passed yet and some members of Congress prefer their own amendments to the act, it is clear that in the future industry will be required to spend more money to meet more stringent regulations. Some people estimate the cost of the revision to industry as a whole will come to as much as $20 billion annually.

WATER. North American bleached kraft pulp mills are scrambling to reduce the use of chlorine so they discharge less dioxin in effluent, sludge, and the pulp itself. At the federal level, the Environmental Protection Agency (EPA) has not determined if dioxin needs to be regulated, but some states and regional offices of EPA are writing dioxin limits into effluent discharge permits. EPA is expected to decide by April 1990 if dioxins in effluent need to be regulated. It has placed at least 88 of the 104 bleached kraft pulp mills in the U.S. on the short list under section 304L of the Clean Water Act (*P&P*, September 1989, p. 105), meaning that mills will have to meet limits on dioxin in their effluent by June 4, 1992. Some of these limits are as low as 0.4 parts per quadrillion, but current technology is not sensitive enough to test these levels.

Separately, Canadian provinces have announced limits on dioxin and have mandated process changes. For example, the 17 bleached kraft pulp mills in British Columbia will be required to install secondary treatment systems by 1994 at an estimated combined cost of C$800 million and to limit discharges of chlorinated organic compounds to 1.5 kg/metric ton of pulp by 1994. The province of Alberta requires all bleached kraft pulp mills to use extended delignification and install oxygen delignification systems. Both Canadian and U.S. pulp mills are chasing after chlorine dioxide generators—order backlogs are said to be about 18 months.

It is likely that by April 1990 EPA will decide to regulate dioxin. If nothing else, federal regulation will clarify some of the legal questions of why some regions and states are imposing regulations and others aren't. Expenditures on dioxin control vary from one mill to the next depending on the age of the mill and the kinds of processes it uses. However, RISI estimates an average mill will spend $50 million to control dioxin discharges. There are 151 bleached kraft pulp mills in North America, bringing the expenditure to a whopping $7.5 billion. Unless a mill manages to wrangle permission for a simultaneous capacity expansion, these expenditures will not be offset by savings in operating costs.

SOLID WASTE. It is becoming difficult for mills to get permits to landfill mill sludge—the preferred way of disposal by about 75% of U.S. mills. So far industry has been exempt from the stricter regulations applied to municipal solid waste sites, but EPA is expected to make industrial landfills meet stricter criteria through Subtitle D of the Resource Conservation & Recovery Act. EPA is expected to finalize the industrial nonhazardous solid waste regulations in late 1990 or early 1991. Individual states will have to adopt their own equivalent guidelines 18 months later, retaining permitting and enforcement authority. Mills in some states, such as Wisconsin, will have stricter standards imposed sooner while other states will wait until final federal guidelines are imposed (*P&P*, September 1989, p. 200.)

In terms of long-term profitability, industry executives are more concerned about the effects of state and federal laws mandating recycled fiber use and taxes on virgin fiber than the dioxin issue. Hearings are expected to begin this month on a federal bill that would put an initial 3% tax on profits from paper products that don't comply with EPA's federal recycled paper procurement standards. Other bills that target only newsprint will also be taken up this year. EPA's avowed desire to reduce the source of solid waste in landfills (paper makes up about 40% by weight of municipal solid waste) means people will be urged to consume less paper. This

will directly harm paper companies' bottom line.

Ironically, some paper mills are having trouble getting permits to site recycled paper mills because these mills generate sludge that needs to be landfilled.

PULPWOOD

HIGH PRICES IN WEST; SHORTAGES IN SOUTH

■ Last year witnessed the collapse of the timber sale system from federal lands in the Pacific Northwest, and the effects of resulting aberrations in the woodchip market will spill over into 1990. Preservationists were successful in getting injunctions on about 2 billion bd ft of timber sales in the Northwest, leaving sawmills without their usual supply of logs (*P&P*, Aug. 1989, p. 98). The shortage was compounded by very strong log exports to Japan in the first half. Fortunately, the weather remained good in summer 1989, and logging wasn't curtailed because of fire danger.

Because of uncertainty over the federal timber sale program and because Congress did not decide until last October on the annual allowable cut for fiscal 1990, pulp mills in the Northwest began to stockpile chips. Inventories were built up to such a degree that most woodyard managers felt confident about meeting all contingencies in the fourth quarter.

If this winter is harsher than usual, these inventories will disappear rapidly. On the other hand, demand may come off as the industry enters a down cycle. Also, demand for wood from the San Francisco Bay Area will be high as that region rebuilds from its Oct. 17, 1989, earthquake, meaning more chips will be generated by sawmills in the Northwest. Housing starts last year fell to about 1.35 million compared with about 1.48 million in 1988. Starts for 1990 are forecast at 1.44 million since interest rates may ease, putting more chips on the market.

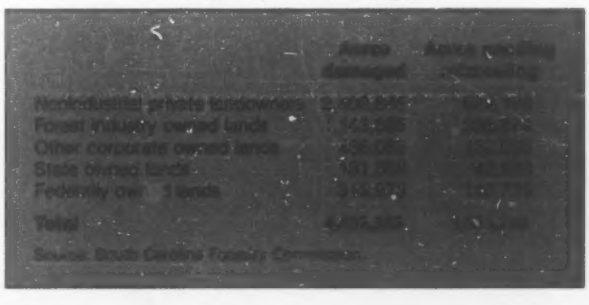
In November 1989, Senator Robert Packwood (R-Ore.) introduced two pieces of legislation that will probably be voted out of committee in the first half of this year. One bill would make permanent the ban on exporting logs cut on federal land. The second bill would allow states to restrict exports of logs from state-owned land. These laws are designed to make more logs available for U.S. sawmills, but some observers feel the restrictions would do little to bolster domestic supply since most of the log exports going to Japan are second-growth timber and the domestic sawmills facing permanent closure can process only old-growth logs.

Domestic chip prices in the region track the export price of chips going to Japan. During second-half 1989, Douglas fir chips moving from the West Coast to Japan were selling for $133/bdu f.o.b. vessel, an increase of $46.30/bdu from second-half 1988. The Japanese are said to be seeking significant reductions in the price for first-half 1990. They were turning away shipments of red alder last fall and were staying out of the market as much as possible since they have rebuilt inventories. Chip prices in the region are forecast to decline in the first half compared with second-half 1989, but in the long term, wood costs for mills in the Northwest will trend higher since most of the old growth that can be logged has been logged and second-growth stands don't yield as much wood per acre. The U.S. Forest Service indicated it will put less federal timber up for sale in the future. Also, some segments of the citizenry in British Columbia are opposed to clear-cutting, so fewer chips will be available for shipment to mills in Washington.

In contrast, chip prices in the South are expected to increase in first-half 1990, particularly for hardwood. Even before Hurricane Hugo hit South Carolina last fall, heavy rains in May and June from Hurricane Alison curtailed logging in the Gulf Coast states of Texas, Louisiana, Mississippi, and Florida. Hardwood is scarcer than pine, partly because it grows in creek bottoms and lowlands more susceptible to flooding. Pulp mills were forced to run more pine in their mix than they would like. The Japanese have also been competing for hardwood. The wet weather made it impossible for woodyard managers in some areas to build winter supplies, which will cause higher chip prices in the first part of this year, particularly in South Carolina and Georgia.

The South Carolina Forestry Commission estimates that one-third of the forestland in the state was damaged by Hurricane Hugo—4.4 million acres or 6.7 billion bd ft of timber. About 1.3 million acres of land need to be reforested. But of most concern is the fact that 16 years' worth of hardwood consumption was destroyed. Observers expect chip prices and stumpage values, particularly for hardwood, to escalate this spring because of reduced supply and increased demand from mills in the region that are expanding their hardwood requirements. For example, Willamette Industries Inc.'s greenfield uncoated free-sheet mill will start up in South Carolina this year and is expected to use about 60% hardwood in its furnish. Union Camp Corp., Eastover, S.C., and Stone Container Corp., Port Wentworth, Ga., both have expansions under way that will require more hardwood.

TABLE 6: **Timber damaged by Hurricane Hugo.**



CAPITAL SPENDING SURVEY: 1989-91

U.S. and Canadian pulp and paper companies stick to record capital spending plans despite evidence of an industry slowdown

By CARL ESPE, News Editor

Capital spending continues to boom in both the U.S. and Canada, despite increasing evidence that the economy is slowing and that the industry faces a cyclical slowdown. In *Pulp & Paper*'s annual end-of-year survey of capital investment, U.S. mills reported plans to spend $18.01 billion on expansion and modernization projects over the 1989-91+ period, an increase of 32% over plans reported a year ago for 1988-90. Proposed projects—under active consideration but with no firm startup date—add another $5.80 billion to spending plans.

The picture is just as dramatic in Canada, where mills report plans to spend C$12.87 billion on improvements over the 1989-91+ period, up 29% from a year ago. In the "proposed" category, another C$4.32 billion worth of projects are under active consideration.

Capacity expansion remains the driving force behind current spending plans. Spending for new paper machines is estimated at $5.14 billion for the U.S. and C$2.47 billion for Canada. Spending for new mills with firm startup dates totals $3.29 billion in the U.S. and C$3.22 billion in Canada.

Newsprint took the spotlight last year, especially in Canada, but the most active grades now are recycled paper and paperboard. Recent legislation promoting wastepaper use has led to a flurry of expansion proposals over the past few months, several of which have been approved for startup in 1992 and beyond. Capacity growth is also strong for containerboard, bleached paperboard, uncoated free-sheet, coated free-sheet, and tissue.

High market pulp prices have led to an increase in pulping projects, both to expand tonnage for internal use and for sale. Pulp mill improvements account for 36% of production-related outlays this year in both the U.S. and Canada. Expansion projects have been linked in many cases to necessary environmental improvements to lower total reduced sulfur (TRS) emissions, comply with stricter odor regulations, and reduce dioxin formation. As a result, a number of bleached kraft mills are undergoing sweeping modernization programs.

A SHARP DROP IN 1991? A recent Data Resources Inc. survey, conducted last fall, reported that the U.S. paper industry plans to spend $18.10 billion on capital projects in 1990, an increase of 14.2% over estimated spending of $15.85 billion in 1989. A 14% increase would be a marked drop from the 40% gain posted in 1989 but still a very strong performance. DRI reports that paper companies plan to trim spending in 1991 to $9.89 billion, however, a precipitous drop of 45% from the 1990 forecast.

Overall, manufacturers reported plans to increase spending 6.4% in 1990, following a 10% increase in 1989. Manufacturers plan to trim 1991 spending 2.7%.

P&P's investment survey confirms the DRI results for 1990 but paints a less pessimistic picture for 1991. In the U.S., projects scheduled for startup in 1989 account for $3.70 billion of total planned spending, 1990 startups for $6.44 billion, and 1991 startups for $4.81 billion. Spending for projects targeted for startup in 1992 and beyond amounts to $3.06 billion. In percentage terms, 36% of reported outlays are for 1990 projects, 27% for 1991, and 17% for 1992 and beyond. This pattern suggests that spending will definitely remain high this year, despite the fact that markets have cooled off. Several very large expansion programs have been announced over the past several months for startup in 1991 and beyond, and producers appear committed to strong spending programs.

CANADIAN OUTLOOK. The situation is similar in Canada, where 1989 startups account for C$3.18 billion of total outlays, 1990 startups for C$4.65 billion, and 1991 projects for $1.47 billion. Spending for 1992 startups totals $3.24 billion, but only $315 million worth of projects have been announced for startup in 1993 and beyond. In percentage terms, 36% of total outlays will go for projects started up this year, 11% in 1991, and 25% in 1992. As in the U.S., the high percentage of startups planned for this year should assure another year of record spending. The outlook for 1991 and beyond is

Complete results of P&P's exclusive survey of North American capital spending programs for 1989-91 are available in a separate Mill-by-Mill Listings report. Organized by company, the listings show programs for new mills and machines, rebuilds and modernizations, environmental quality control, and other mill improvements, with specifics on equipment ordered, dates, suppliers, and prices, where available. Subscribers to P&P's monthly newsletter, Project Report, receive a free copy of the report with their January issue. All others may obtain a copy of the report for US$145. To order, send payment to Pulp & Paper, Editorial Dept., 500 Howard St., San Francisco, Calif. 94105.

weaker, however, with a much lower percentage of projects under way for startup in 1991. Spending plans for 1992 remain strong at present, but a sharp downturn this year or next could easily cause postponements or cancellations since few of these projects are under way.

Canadian companies face problems with newsprint oversupply and weakness in other paper grades, a stronger Canadian dollar, and higher wood costs on the West Coast. Third-quarter profits for the Canadian industry were down 37.4% from a year earlier, according to a recent *Pulp & Paper Week* survey. On the other side of the equation, companies have enjoyed strong cash flows for the past two years, allowing them to reduce debt loads and to pursue necessary improvements and expand capacity despite weaker markets.

ABOUT *P&P*'S ANNUAL SURVEY. Now in its twenty-sixth year, *P&P*'s annual capital spending survey covers expansion and modernization programs at U.S. and Canadian mills. Unlike surveys that track spending by year, *P&P*'s survey covers spending by project. Dollar figures represent the total cost of reported projects and often include supporting equipment. The total cost of multiyear projects is assigned to the startup year and is not divided among the years of expenditure. Each survey primarily covers a three-year period—the current survey covers 1989-91—but projects with firm startup dates beyond that time frame are also included. ■

UNITED STATES

EXPANSION-MINDED COMPANIES LEAD OFF THE DECADE WITH RECORD SPENDING PLANS

■ Ambitious capacity expansion plans will buoy record capital spending plans at U.S. pulp and paper mills this year. Prices and profits may be down, but you won't see it reflected in this year's capital spending plans—at least not yet.

Spending totals $18.01 billion for the 1989-91+ period in *P&P*'s latest survey, up 31.6% from last year. This follows an increase of over 70% in 1988, when mills reported plans to spend $13.7 billion on 1988-90 projects. Spending on projects for startup in 1989 was about 15% higher than expected a year ago, while spending committed for 1990 startups is up 29%.

Spending for production-related improvements totals $16.76 billion for 1989-91, an increase of 28.9% over last year. The largest percentage gains are for pulp mill improvements and for new paper machine installations, up 39.2% and 38.1%, respectively. Spending for paper machine rebuilds is up a more modest 13.0% over last year's survey, while woodyard spending climbed 7.1%. Energy improvements continue to lag other types of investment, reflecting lower fuel and electricity prices.

U.S.—REPORTED CAPITAL EXPENDITURES FOR 1989-91+ BY REGION AND TYPE OF FACILITY ($000)

PRODUCTION-RELATED EXPENDITURES

	WOOD/FIBER		PULPING		NEW MACHINES		REBUILDS		ENERGY		PLANT	
New England	25,000	5%	345,200	5%	560,000	11%	307,100	13%	273,500	20%	136,600	13%
Mid-Atlantic	0	0%	37,650	1%	0	0%	103,056	4%	114,521	8%	100	0%
East North Central	28,800	6%	328,010	5%	886,350	17%	380,951	16%	172,540	13%	177,831	17%
West North Central	71,000	14%	318,865	5%	493,455	10%	66,300	3%	8,976	1%	80,854	8%
South Atlantic	92,875	18%	2,121,680	33%	1,478,113	29%	681,130	29%	274,200	20%	213,433	21%
East South Central	233,796	46%	1,866,051	29%	539,070	10%	332,600	14%	372,686	27%	284,462	28%
West South Central	40,300	8%	253,350	4%	645,900	13%	319,200	14%	42,500	3%	69,750	7%
Mountain/Pacific	15,300	3%	1,107,303	17%	512,750	10%	169,400	7%	401,300	7%	59,755	6%
Total	**507,071**		**6,378,109**		**5,136,638**		**2,389,737**		**1,399,228**		**1,882,784**	

ENVIRONMENTAL QUALITY SPENDING

	WATER		AIR		SOLID WASTE		PRODUCTION		ENVIRONMENT		TOTAL	
New England	0	0%	5,750	1%	9,400	16%	1,667,400	10%	15,150	1%	1,682,550	9%
Mid-Atlantic	2,178	0%	7,500	1%	1,950	3%	255,327	2%	11,628	1%	266,955	1%
East North Central	9,980	1%	15,278	3%	6,095	10%	1,974,481	12%	31,353	3%	2,005,834	11%
West North Central	4,752	1%	4,752	1%	396	1%	1,039,450	6%	9,900	1%	1,049,350	6%
South Atlantic	206,382	30%	141,212	28%	7,436	13%	4,861,431	29%	355,030	28%	5,216,461	29%
East South Central	266,382	39%	209,818	42%	16,290	31%	3,628,665	22%	494,490	40%	4,123,155	23%
West South Central	25,160	4%	25,165	5%	5,375	9%	1,371,000	8%	55,700	4%	1,426,700	8%
Mountain/Pacific	170,755	25%	92,275	18%	10,000	17%	1,965,808	12%	273,030	22%	2,238,838	12%
Total	**685,589**		**501,750**		**58,942**		**16,769,562**		**1,948,281**		**18,009,843**	

States are assigned to regions as follows:
New England: Maine, Vt., N.H., Conn., R.I., Mass.
Mid-Atlantic: N.Y., N.J., Pa.
East North Central: Wis., Mich., Ill., Ind., Ohio
West North Central: N.Dak., S.Dak., Nebr., Kans., Minn., Iowa, Mo.
South Atlantic: Del., Md., W.Va., Va., N.C., S.C., Ga., Fla.
East South Central: Ky., Tenn., Miss., Ala.
West South Central: Okla., Texas, Ark., La.
Mountain/Pacific: Wash., Ore., Calif., Alaska, Idaho, Nev., Mont., Wyo., Utah, Ariz., Colo., N.Mex.

Power plant outlays are up 0.5% to $1.36 billion for 1989-90.

Spending for environmental improvements jumped to $1.25 billion in this year's survey, an increase of 83.2% over last year. Three years of increases have pushed environmental spending to its highest level since the 1970s. Higher spending for environmental programs will be necessary over the next several years to comply with more stringent regulation of both water and air pollution. Current spending plans for environmental improvements make up 6.9% of total outlays, up from 5% last year—still well shy of the spending levels of the early 1970s.

Reflecting widespread moves to combat dioxin formation, water quality spending is the highest priority in current environmental spending plans. The total reported for 1989-91 is $686 million, up 63.3% from last year. Spending for air improvements totals $502 million, an increase of 130.8%. Outlays to handle solid waste total $59 million in this year's survey, up 37.6% after a drop of 19% last year.

Faced with a solid waste problem that threatens to grow to crisis proportions, more than a dozen states are considering or have already passed laws mandating increased use of recycled fiber in newsprint and other paper grades. This situation has led to a boom in secondary fiber expansion projects and proposals, as papermakers scramble to position themselves for what promises to be a very different market.

PULPING IMPROVEMENTS LEAD SPENDING. Pulp mill expansion and modernization projects capture the largest share of spending in this year's survey. Mills report plans to spend $6.38 billion on pulping projects during the 1989-91 period, or 38.0% of total production-related spending. Pulp mill spending accounted for 35% of total outlays in last year's survey and 24% the year before.

Capacity expansion, environmental upgrading, and cost reduction are the three most important factors in current pulp mill spending plans. Mills are expanding both market pulp capacity and captive pulp capacity to support more paper and paperboard production. Environmental improvements center on odor control and on reducing chlorine use to limit dioxin formation.

High prices and tight markets have made market pulp capacity expansion the driving force behind pulp mill spending. Several of these projects are at mills that did not previously produce market pulp.

Four major projects scheduled for completion this year will add almost 500,000 tpy of bleached kraft market pulp capacity at a cost of over $800 million. In the largest, Weyerhaeuser Co. will start up a new 358,000-tpy mill at its Columbus, Miss., facility at a cost of $500 million. Bowater Inc. is building a complete new bleached kraft pulp mill at Calhoun, Tenn., at a cost of $205 million. The other two projects will improve existing facilities at James River Corp., Camas, Wash., and Louisiana-Pacific Corp., Samoa, Calif.

In 1991, Parsons & Whittemore Inc. will complete construction of a new $700-million bleached softwood kraft market pulp mill at Claiborne, Ala. The Alabama-Pine Co. mill will have capacity for 1,250 metric tpd. Stone Container Corp.'s Port Wentworth, Ga., mill will start up a new 740-tpd bleached hardwood kraft market pulp mill as part of a $335-million modernization, and

U.S. GREENFIELD MILL PROJECTS

STARTED UP IN 1989

FSC Paper, Alsip, Ill.
80,000-tpy recycled tissue; Sulzer Escher Wyss paper machine

Newsprint South, Grenada, Miss.
225,000-tpy TMP/newsprint; Beloit paper machine

Ponderay Newsprint, Usk, Wash.
180,000-metric-tpy TMP/newsprint; Valmet paper machine

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

Alabama River Newsprint, Claiborne, Ala. **1990**
242,500-metric-tpy TMP/newsprint; Valmet paper machine

Kimberly-Clark, Jenks, Okla. **1990**
68,000-tpy tissue; one paper machine

Kimberly-Clark, Loudon, Tenn. **1990**
C & I tissue; about half the size of Jenks mill

Mead, Mahrt, Ala. **1990**
350,000-tpy coated natural kraft paperboard; Valmet paper machine

Mi Ho Paper, St. Joseph, Mo. **1990**
Recycled coated and uncoated fine paper mill

Williamette Industries, Bennetsville, S.C. **1990**
200,000-tpy uncoated free-sheet; Valmet paper machine

Kenaf of North America, Muskogee, Okla. **1991**
750-tpd recycled containerboard mill; Tampella machine

Parsons & Whittemore, Claiborne, Ala. **1991**
1,250-metric-tpd bleached softwood kraft market pulp

Daishowa/Trans-Rim, Stockton, Calif. **1992**
350,000-tpy recycled containerboard mill

Inland Container, Maysville, Ky. **1993**
600-tpd recycled containerboard mill

PROPOSED (NO STARTUP DATE)

Dunkirk Paperboard, Dunkirk, N.Y.
250,000-tpy recycled containerboard mill

Evco, San Augustine, Texas
500-metric-tpd market CTMP mill

Garden State Paper, Northeast U.S.
Studying recycled newsprint mill for northeast U.S.

Great Northern/MD Papier, Millinocket, Maine
760-tpd lightweight coated paper, 1992 target

Northampton Paperboard, Northampton, Pa.
500- to 600-tpd recycled linerboard; preliminary study stage

Scott Paper, undecided location
Tissue mill with converting lines

Smurfit Newsprint, Northeast U.S.
250,000-tpy recycled newsprint mill; 1993 target

Westbrook Wood Products, Medford, Ore.
Publication papers mill

WTD Industries, Port Westward, Ore.
300,000-tpy market bleached softwood kraft pulp

Union Camp Corp. will complete a 105,000-tpy market pulp facility in its $675-million expansion program at Eastover, S.C. Potlatch Corp. plans a new oxygen delignification system and single pulp line to add 45,000 tpy to bleached kraft pulp capacity at Lewiston, Idaho, at a cost of $105 million.

A four-year, $408-million modernization at Champion International Corp.'s Courtland, Ala., mill for completion in 1993 includes 250,000 tpy of new bleached kraft pulp capacity.

Plans for new pulp mills in Oregon face environmental challenges that have delayed one project and possibly killed another. WTD Industries Inc.'s permit application for a 300,000-tpy, $420-million bleached softwood kraft market pulp mill to be built at Port Westward, Ore., was denied this fall, throwing the project into limbo. Pope & Talbot Inc.'s proposed $350-million expansion at Halsey, Ore., is still in the permitting process and has been pushed back from its original 1991 target date to 1992.

Large-scale pulp expansion programs are also under way at integrated mills expanding capacity for printing and writing grades, kraft linerboard, and bleached paperboard. Nekoosa Papers Inc. installed a new $90-million recovery boiler last year in support of an uncoated free-sheet expansion due for completion in 1991. This year, Boise Cascade Corp. will complete kraft pulp expansions at two mills: Rumford, Maine, and International Falls, Minn.

Union Camp's $375-million restructuring program at the Savannah, Ga., kraft linerboard mill, set for completion in early 1991, includes extensive pulp mill modernization work. Gaylord Container Corp. is another linerboard producer spending heavily to modernize pulp facilities, both at Bogalusa, La., and Antioch, Calif. Nekoosa Packaging Corp. has approved a major upgrade program for its Valdosta, Ga., kraft linerboard mill that focuses on pulp improvements.

A major bleached paperboard expansion at Westvaco Corp.'s Covington, Va., mill includes a new $130-million recovery boiler and more kraft pulp capacity. Startup is set for 1991. Federal Paper Board Co. Inc. will complete another large increase in pulp capacity to support a bleached paperboard expansion targeted for completion in 1992. Just last month, Gulf States Paper Corp. announced a $250-million plan to double pulping capacity at its Demopolis, Ala., mill in anticipation of a bleached paperboard expansion later in the decade. The pulp expansion project will be completed within four years.

Spending for paper machine modifications and improvements is up 13.0% from last year's survey, reflecting a continuing boom in capacity expansion projects. Spending for rebuild projects totals $2.36 billion for the 1989-91 period.

Rebuilds will continue to contribute the most to new capacity in the containerboard sector, where few new paper machines are scheduled. Wide-nip press installations have allowed linerboard and corrugating medium producers to raise capacity for far less than the cost of new machines. Containerboard mills with extensive machine modernization programs under way include Gaylord Container, Antioch, Calif.; Green Bay Packaging Corp. at Green Bay, Wis., and Morrilton, Ark.; MacMillan Bloedel Inc., Pine Hill, Ala.; and Jefferson Smurfit Corp., Jacksonville, Fla. International Paper Co. modernized its Vicksburg, Miss., machine in 1989 and is considering similar projects for Pineville, La., and Gardiner, Ore.

Among bleached paperboard mills, Federal Paper Board at Augusta, Ga., and International Paper at Pine Bluff, Ark., and Texarkana, Texas, have major modernization and expansion programs under way. In the coated paper sector, Boise Cascade at Rumford, Maine, and Scott Paper Co.'s S.D. Warren Div. at Muskegon, Mich., are adding coated free-sheet capacity through machine rebuilds. Additional large-scale printing and writing paper machine improvement programs are under way at Champion, Courtland, Ala.; Westvaco, Luke, Md.; and Fraser Inc., Madawaska, Maine.

U.S. mills report plans to spend $1.36 billion on power plant improvements during the 1989-91 period, an increase of just 0.5% over last year's plans. Energy projects have slipped to an 8.1% share of production-related spending, down from 10% last year and 17% the year before. Thanks largely to lower energy prices, mills have been able to shift their spending priorities to other areas of the mill. Power plant outlays have declined steadily since the early years of the decade as a percentage of total mill spending.

The number of new power boilers currently planned at U.S. mills is down sharply from past years. Some 15 new power boilers have been approved for the 1989-91 period. That compares with over 25 installations in the 1987-89 period and 40 or more during 1985-87. In contrast to the cutback in new power boilers, the number of new recovery boilers approved recently has risen sharply, as mills gear up for a major wave of kraft pulp expansion.

NEW MILLS AND MACHINES. New paper machines account for 30.6% of total production spending in this year's survey, up from 28.6% last year. Planned spending for 1989-91 totals $5.14 billion, up 38.1% from last year.

New paper machine announcements have climbed dramatically over the past two years. Twenty-three new paper machines and another 12 machines at new mills are scheduled for startup during the 1989-92 period. The total number in last year's survey was 28 machines. The most active grades for new machines are tissue, coated and uncoated free-sheet paper, newsprint, kraft paperboard, and recycled paperboard.

Thirteen new paper machines are scheduled to come

online this year, seven at existing mills and six at greenfield facilities. Mead Corp. is building a new $556-million coated natural kraft paperboard mill at Phenix City, Ala. Gaylord Container will start up a new 1,000-tpd linerboard machine at Bogalusa, La., the first new linerboard unit to be built since 1985. Union Camp's $375-million modernization and expansion at Savannah, Ga., will replace two older units with a new kraft linerboard machine in 1991, and Jefferson Smurfit plans a new linerboard machine for its Fernandina Beach, Fla., mill.

In uncoated free-sheet, Willamette Industries Inc. is building a greenfield mill at Bennetsville, S.C., for startup in 1990, and Boise Cascade has undertaken an extensive $525-million modernization and expansion program at International Falls, Minn. Union Camp will complete a $700-million expansion in 1991 that includes a new paper machine at its Eastover, S.C., mill. Also in 1991, Nekoosa Papers will complete a $500-million expansion at Ashdown, Ark., adding 325,000 tpy.

Champion International is installing a new coated free-sheet unit at its Quinnesec, Mich., market pulp mill this year, and Scott Paper's S.D. Warren Div. is building another lightweight coated free-sheet unit at Skowhegan, Maine. In 1991, Consolidated Papers will complete installation of a new $400-million coated free-sheet machine at the Wisconsin Rapids Div. Most recently, Boise Cascade announced plans for a $450-million coated groundwood expansion at Rumford, Maine, targeted for completion in late 1993.

This year, Alabama River Newsprint Co., a joint venture of Abitibi-Price Inc. and Parsons & Whittemore, will bring online a newsprint mill at Claiborne, Ala., at a cost of $320 million. North Pacific Paper Corp. has approved a new recycled newsprint machine to be installed at Longview, Wash., along with new deinking facilities and pulp improvements. The $300-million program is scheduled for completion in 1991.

Chesapeake Corp.'s Wisconsin Tissue Mills facility in Menasha, Wis., will start up a new recycled tissue mill this year, and Kimberly-Clark is building two new tissue mills this year, at Jenks, Okla., and Loudon, Tenn. Fort Howard Corp. plans to install a fourth recycled tissue machine at Rincon, Ga., in 1991.

A new recycled containerboard machine is scheduled for startup in each of the next three years. Due first in 1991 is Kenaf of North America Inc.'s $130-million, 750-tpd mill in Muskogee, Okla. Daishowa America Inc. and Trans-Rim Enterprises Ltd. will build a $200-million, 350,000-tpy facility in Stockton, Calif., for startup in 1992. Finally, Inland Container Corp. has announced a new $160-million mill for Maysville, Ky., with capacity for 600 tpd.

The bleached board sector is scheduled to get two new machines in 1992. Federal Paper Board's Augusta, Ga., mill is installing a $375-million, 650-tpd unit, and Westvaco is expanding at Covington, Va., at a cost of $400 million. ■

NEW PAPER MACHINES IN U.S. AT EXISTING MILL SITES

STARTED UP IN 1989

Blandin Paper, Grand Rapids, Minn. — 1989
254,000-tpy, 306-in.-trim machine, replacing one—LWC

Fort Howard, Green Bay, Wis.
Fourth recycled tissue machine

Fort Howard, Rincon, Ga.
250-tpd, 270-in. Beloit—tissue

Hollingsworth & Vose, Hawkinsville, Ga. — 1989
Specialty industrial paper machine—auto filter paper

Kimberly-Clark, Whiting, Wis. — 1989
30,000-tpy machine—premium correspondance and specialty paper

Southeast Paper Manufacturing, Dublin, Ga. — 1989
210,000-tpy, 330-in.-trim Valmet—newsprint

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

Boise Cascade, International Falls, Minn. — 1990
300,000-tpy, 348-in.-trim Valmet—uncoated free-sheet

Champion International, Quinnesec, Mich. — 1990
265,000-tpy, 280-in.-trim Beloit—coated free-sheet

Chesapeake, Menasha, Wis. — 1990
80,000-tpy Beloit twin-wire—recycled tissue

Consolidated Papers, Stevens Point, Wis. — 1990
59,000-tpy, 180-in. yankee fourdrinier—specialty coated

Gaylord Container, Bogalusa, La. — 1990
1,000-tpd machine—kraft linerboard

Longview Fibre, Longview, Wash. — 1990
240-in.-trim, 3,000-fpm Beloit—kraft paper

Scott Paper, Skowhegan, Maine — 1990
Lightweight coated free-sheet machine

Consolidated Papers, Wisconsin Rapids, Wis. — 1991
212,000-tpy, 285-in. fourdrinier—coated free-sheet

Fort Howard, Rincon, Ga. — 1991
250-tpd, 270-in. Beloit—tissue

Great Northern Nekoosa, Ashdown, Ark. — 1991
210,000-tpy No. 64 machine—uncoated free-sheet

Union Camp, Eastover, S.C. — 1991
240,000-tpy No. 2 machine—uncoated free-sheet

Union Camp, Savannah, Ga. — 1991
460,000-tpy, 363-in. Valmet, replacing two-kraft linerboard

Weyerhaeuser/North Pacific, Longview, Wash. — 1991
230,000-metric-tpy machine—recycled newsprint

Federal Paper Board, Augusta, Ga. — 1992
650-tpd machine-bleached paperboard (bristols)

Jefferson Smurfit, Fernandina Beach, Fla. — 1992
New linerboard machine

Westvaco, Covington, Va. — 1992
350,000-tpy machine-bleached paperboard

Boise Cascade, Rumford, Maine — 1993
318,000-tpy, 325-in. machine—LWC

PROPOSED (NO STARTUP DATE)

Cascades/Steinbels, Niagara Falls, N.Y.
100,000-metric-tpy recycled computer printout paper

Daishowa America, Port Angeles, Wash.
Studying two machines, one 220,000-tpy newsprint and one 150,000-tpy directory—delayed

Fort Howard, Muskogee, Okla.
New recycled tissue machines under study

Fraser Paper, Madawaska, Maine
Studying new lightweight coated paper machine

Golden State, Pomona, Calif.
230,000-tpy machine—recycled newsprint

Gulf States, Demopolis, Ala.
Bleached paperboard machine; mid-1990s target

James River, St. Francisville, La.
Considering new coated printing paper machine

Madison Paper, Madison, Maine
[illegible] target 199[illegible]

CANADA

MARKET PULP EXPANSION, ENVIRONMENTAL PROGRAMS LEAD RECORD SPENDING DRIVE

■ Canadian capital spending is up 29.3% in this year's survey of 1989-91 investment plans, following a 49.0% increase last year. Companies report plans to spend C$12.87 billion on capital projects during the 1989-91 period, up from $9.95 billion reported last year for 1988-90. The ongoing expansion boom and a big boost in environmental spending are most responsible for the increase, which comes despite a deterioration in profits from weak newsprint markets, rising costs, and the strong Canadian dollar.

Strong capacity growth in Canada will continue into the early 1990s, according to the 1988-91 Canadian Pulp & Paper Assn. capacity survey. Total Canadian paper and paperboard capacity will climb from 17.0 million metric tons in 1988 to 20.3 million tons in 1991, an increase of 19.2%. Total pulp capacity will climb 13.5% over the same period, from 25.0 million tons in 1988 to 28.4 million tons in 1991. Market pulp capacity, which accounts for about a third of total pulp capacity, will rise 12.5%, from 8.4 million tons in 1988 to 9.5 million tons in 1991.

Growth will be over three times as strong for the 1989-91 period as for the preceding ten years in all three categories: paper and board, total pulp, and market pulp. Growth will average 5.9% a year for paper and board, compared with 1.8% over the 1979-88 period. Market pulp growth will average 4.0% annually through 1991, up from 1.33% a year over the past ten years.

While virgin newsprint will suffer from overcapacity over the next couple of years, a shortage of recycled newsprint could occur because of legislation in the U.S. promoting its use. Many North American newsprint producers that are not using any secondary fiber now are seriously considering some type of expansion into recycled newsprint. Canadian producers are in a particularly tight spot because they are building most of the virgin-pulp newsprint capacity currently under construction, and they are poorly situated geographically to increase usage of recycled fiber.

In eastern Canada, Abitibi-Price Inc., Bowater Mersey Paper Co., Daishowa Forest Products Ltd., Donohue Inc., and Kruger Inc. are all studying plans to incorporate secondary fiber in their newsprint operations. Last year, Donohue opted for a thermomechanical pulp (TMP) expansion scheduled for completion this year after first considering construction of a new 50,000-tpy deinking facility. Now, the original plan to add deinking capacity is being reconsidered. In November, Noranda Forest Inc. announced the formation of Noranda Forest Recycled Papers to concentrate its recycling efforts into one company. Centered around the Thorold, Ont., mill formerly belonging to Fraser Inc., the new division is planning what it says will be the world's largest recycled printing and writing paper facility, with capacity for 115,000 tpy.

In western Canada, a new California recycling law has prompted Fletcher Challenge Canada Ltd. and MacMillan Bloedel Ltd. to announce plans for deinking facilities. Both companies are considering projects in the $60- to $90-million range. MB ships about 225,000 tpy of newsprint to California, or 39% of the output from its

CANADA—REPORTED CAPITAL EXPENDITURES FOR 1988-90+ BY REGION AND TYPE OF FACILITY (C$000)

PRODUCTION-RELATED EXPENDITURES

	WOOD/FIBER		PULPING		NEW MACHINES		REBUILDS		ENERGY		PLANT	
Maritimes	32,961	6%	355,047	6%	370,000	15%	669,000	77%	30,000	4%	48,350	10%
Quebec	38,035	7%	1,229,114	22%	1,075,000	44%	270,488	28%	112,016	15%	93,968	20%
Ontario	25,068	5%	702,138	12%	420,000	17%	304,124	31%	138,724	19%	76,000	16%
Central	100,000	18%	200,000	4%	0	0%	0	0%	0	0%	23,250	5%
West	350,318	64%	3,154,378	56%	601,595	24%	332,000	234%	446,507	61%	220,474	48%
Total	**546,382**		**5,640,677**		**2,466,595**		**973,612**		**727,247**		**462,222**	

ENVIRONMENTAL QUALITY SPENDING

	WATER		AIR		SOLID WASTE		PRODUCTION		ENVIRONMENT*		TOTAL	
Maritimes	4,250	0%	11,750	3%	3,500	5%	903,438	8%	19,500	1%	922,938	7%
Quebec	125,700	8%	53,719	14%	37,656	54%	2,818,621	26%	217,075	11%	3,035,696	24%
Ontario	155,498	10%	5,010	1%	1,328	2%	1,656,054	15%	161,836	8%	1,827,890	14%
Central	0	0%	0	0%	0	0%	323,250	3%	0	0%	323,250	3%
West	1,306,853	82%	315,916	82%	27,398	39%	5,105,272	47%	1,650,167	81%	6,755,439	53%
Total	**1,592,301**		**386,395**		**69,882**		**10,816,635**		**2,048,578**		**12,895,213**	

two British Columbia mills. Fletcher Challenge's shipments to California total about 300,000 tpy, or 26% of its British Columbia output. Another proposal was announced late last year by Newstech Recycling for a new $80-million, 122,500-tpy market deinked groundwood pulp mill to be built in the Vancouver, B.C., area.

FOREIGN INVESTMENT A BIG FACTOR. Much more than in the U.S., capital spending is getting a boost in Canada from overseas investment, especially from Japan. Crestbrook Forest Industries Inc., majority owned by Honshu Paper Co. and Mitsubishi Corp. of Japan, is pursuing plans to build the largest single-line pulp mill in the world in the Athabasca-Lac La Biche region of Alberta. The 496,000-metric-tpy bleached hardwood kraft market pulp mill. Alberta-Pacific Forest Industries Inc., was originally targeted for late 1991, but the project has run into stiff opposition in the permitting process because of environmental concerns. The C$1-billion project is now targeted for completion in 1992.

Daishowa of Japan is building a greenfield market bleached kraft mill in Peace River, Alta., for startup in 1993. The $500-million mill will produce 340,000 tpy. In addition, Oji Paper of Japan has entered into a joint venture with Canfor Corp. to boost market pulp capacity 225,000 tpy this year at the Howe Sound Pulp & Paper Co. Ltd. mill in Port Mellon, B.C. That project will cost $80 million. Howe Sound will then build a new 300,000-tpy newsprint mill at Port Mellon in a $355-million program targeted for completion in 1991. Celgar Pulp Co., partly owned by Japanese and American interests, recently approved a $630-million program at Castlegar, B.C., to double bleached softwood kraft market pulp capacity and upgrade environmental systems.

Entrepreneurial investment is also a key factor in the Canadian industry, particularly in the area of bleached chemi-thermomechanical market pulp (BCTMP). Millar Western Pulp Ltd. is proceeding with a second greenfield BCTMP mill with capacity for 240,000 tpy at Meadow Lake, Sask. The $235-million project is scheduled for completion in 1992. Fibreco Export Inc. is building a second, 180,000-tpy BCTMP plant at Taylor, B.C., for startup in 1993 at a cost of $195 million.

SPENDING BY CATEGORY. Spending for production-related projects totals $10.82 billion for 1989-91, up 15.0% from last year. Environmental spending plans are up a whopping 276.6%, climbing from $544 million in last year's 1988-90 survey to $2.05 billion this year. Environmental projects now claim a 15.9% share of overall spending, up threefold from last year.

Spending to control water pollution is up the most, climbing over 500% from $263 million in the 1988-90 period to $1.59 billion for 1989-91. Air quality projects show a 56.4% increase over last year, totaling $386 million. Spending for solid waste disposal is up 105% to $70 million for the 1989-91 period.

British Columbia is home to the largest share of water quality improvement projects, most of which are components of larger expansion programs. The focus of all these projects is chlorine substitution in the bleaching process to eliminate dioxin formation and installation of modern secondary treatment systems. Canfor will spend $150 million to eliminate dioxin formation and upgrade secondary treatment at Prince George, B.C., as part of a multiyear modernization and expansion program adding 1,000 tpd to bleached kraft pulp capacity. Fletcher Challenge Canada plans to spend over $200 million on environmental improvements at its three mills in British Columbia. Work includes chlorine substitution projects and new activated sludge treatment systems for the Campbell River and Crofton mills. Western Pulp Limited Partnership will install a $50-million secondary treatment system at its Woodfibre, B.C., mill by 1992.

Howe Sound Pulp & Paper boosted the environmental component of its kraft pulp mill expansion by 76% last year for chlorine substitution equipment and a secondary treatment system. MacMillan Bloedel will spend $68 million through 1992 on environmental improvements at its three British Columbian mills.

NEW PAPER MACHINES IN CANADA AT EXISTING MILL SITES

STARTED UP IN 1990

Canadian Pacific Forest, Dryden, Ont.
175,000-tpy, 285-in.-trim Valmet—uncoated free-sheet

Cascades, Kingsey Falls, Que.
25,000-tpy tissue machine

Domtar, Windsor, Que.
175,000-tpy, 330-in. Beloit—uncoated free-sheet

Finlay Forest Industries, Mackenzie, B.C.
600-tpd, 303-in.-trim Voith—newsprint

Irving Pulp & Paper, St. John, N.B.
60,000-tpy, 206-in. trim Voith—tissue

Repap Enterprises, Newcastle, N.B.
260,000-tpy, 300-in.-trim Voith—coated paper

Tembec, Temiscaming, Que.
110,000-tpy, 177-in.-trim Tampella—bleached paperboard

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

Canadian Pacific Forest, Thunder Bay, Ont. — 1990
240,000-tpy, 362-in. Valmet, replacing two—newsprint

Kruger, Trois Rivières, Que. — 1990
180,000-tpy, 300-in.-trim Beloit twin wire—newsprint

Stone-Consolidated, Grand'Mère, Que. — 1990
183,000-tpy machine replacing two—groundwood specialties

Perkins Papers, Candiac, Que. — 1991
28,000 short tpy—tissue

PROPOSED (NO STARTUP DATE)

[illegible]

Woodyard improvements show the highest percentage growth over last year among production-related projects, rising 107.6% to $546 million. Spending in the power plant is up 43.8% to $727 million. Outlays for new paper machines declined by 21.3% in this year's survey, reflecting the startup of three machines in 1988 and the addition of only two small machines, both tissue units, to this year's list.

Pulp mill improvements account for over half of all production-related spending in the 1989-91 period. Pulp mill spending plans total $5.64 billion, up 35.0% from last year's survey. Paper machine rebuilds amount to just 9% of production spending, reflecting continued emphasis on new paper machine installations, which have a 23% share. Rebuild spending totals $974 million, up 4.7% from 1988-90.

New mills and paper machines focus on newsprint, tissue, and printing/writing grades as well as on kraft and mechanical market pulp. Two new paper mills and seven new paper machines at existing facilities were started up in 1989. Canadian Pacific Forest Products Ltd. started up a new $323-million greenfield mill at Gold River, B.C., and Finlay Forest Industries Ltd. integrated its market refiner mechanical pulp mill at Mackenzie, B.C., with a $165-million newsprint machine.

Also in 1989, Domtar Inc. completed its four-year, billion-dollar modernization program at Windsor, Que., with the installation of a second new uncoated free-sheet machine. Another uncoated free-sheet unit came online at Canadian Pacific Forest Products' Dryden, Ont., mill. That project cost $175 million. Repap Enterprises Corp. Inc. installed a second coated paper machine at its Newcastle, N.B., facility in a $370-million improvement program. At Tembec Inc.'s Temiscaming, Que., mill, a new $265-million bleached paperboard machine was started up in 1989.

A second wave of newsprint capacity will hit late this year, when Kruger Inc. at Trois Rivières, Que., and Canadian Pacific at Thunder Bay, Ont., bring new machines online. Alberta Newsprint Co. Ltd., a new $360-million mill in Whitecourt, Alta., is also scheduled for startup this year. Kruger will offset its newsprint expansion by converting some capacity at Trois Rivières and Corner Brook, Nfld., to supercalendered paper. Improvements at both mills will cost $400 million. Atlantic Packaging Products Ltd. started up a recycled mill in Whitby, Ont., with one tissue machine in late 1989 and will bring online a newsprint machine there this year. Also in 1990, Stone-Consolidated Inc. will complete a $280-million groundwood specialties machine installation at Grand'Mère, Que., replacing two old machines.

Two greenfield market CTMP mills are scheduled for completion this year: Alberta Energy, Lesser Slave Lake, Alta., and Donohue, Matane, Que. The Alberta Energy mill will cost $168 million and the larger Donohue mill $289.5 million. Louisiana-Pacific is constructing a new 155,000-tpy CTMP facility at Chetwynd, B.C., for completion in 1991. The $250-million program also includes two waferboard plants.

In the kraft pulp sector, two large-scale expansions are planned in addition to the projects mentioned. Weldwood of Canada Ltd. will complete a US$290-million expansion this year to double bleached softwood kraft pulp capacity at Hinton, Alta. Also in Alberta, Procter & Gamble Cellulose Ltd. plans to expand its existing bleached softwood kraft market pulp mill in Grande Prairie, Alta., and then build a second mill to produce up to 300,000 tpy of hardwood pulp. The $365-million program is targeted for completion by 1992. ■

CANADIAN GREENFIELD MILL PROJECTS
(metric tons)

STARTED UP IN 1989

Canadian Pacific Forest, Gold River, B.C.
225,000-tpy CTMP/newsprint; Beloit paper machine

Vicell Canada Tissue, Delta, B.C.
9,000-tpy dry form tissue

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

Alberta Energy, Lesser Slave Lake, Ont. — 1990
110,000-tpy market bleached CTMP

Alberta Newsprint, Whitecourt, Alta. — 1990
220,000-tpy CTMP/newsprint

Atlantic Packaging Products, Whitby, Ont. — 1990
Recycled 35,000-tpy tissue and 150,000-tpy newsprint; two Voith machines

Daishowa Paper, Peace River, Alta. — 1990
340,000-tpy bleached kraft market pulp

Donohue, Matane, Que. — 1990
190,000-tpy bleached market CTMP

Howe Sound Pulp & Paper, Port Mellon, B.C. — 1991
535-tpd TMP/newsprint

Louisiana-Pacific, Chetwynd, B.C. — 1991
155,000-tpy bleached market CTMP

Alberta-Pacific Forest, Athabasca, Alta. — 1992
496,000-tpy bleached kraft pulp, delayed one year

Interchem Industries, Port Clement, B.C. — 1992
100-metric-tpd sulfite pulp mill

Millar Western, Meadow Lake, Sask. — 1992
240,000-tpy bleached market CTMP mill

PROPOSED (NO STARTUP DATE)

Alcan Aluminum, Vanderhoof, B.C.
LWC or newsprint mill proposal changed to CTMP

Aspira Resource, Kalum, B.C.
250,000-tpy TMP mill, possibly with paper machine

Mekin Pulp & Paper, Britannia Beach, B.C.
220,000-tpy publication paper; 1992 target

Newstech Recycling, Vancouver, B.C.
122,500-tpy market deinked groundwood pulp mill

Nortak Forest Products, Nipawin, Sask.
100,000-tpy Stake-process hardwood market pulp

Repap Enterprises, The Pas, Man.
1,200-tpd bleached softwood kraft pulp mill

Shin Ho Canada, Thunder Bay, Ont.
150,000-tpy bleached hardwood CTMP mill

Stake Technology, Rimouski, Que.
100,000-tpy bleached hardwood market pulp

[illegible]